

DRAGON USER



The independent Dragon magazine

October 1986

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Amateur radio — voice over a tape — random numbers — any Delta DOS Users? — a lost bridge cartridge — easy deletions — corrections and suggestions.

News

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People's Chart

This month's top five games and an opportunity to win £25 worth of software.

Dragonsoft

Sendhorn Computing's new word processor — fifty games dear at the price.

Communication

Printer problems are popular in this month's readers' question corner. Do you have the answers?

Disc Rescue

Park D'Arcy shows how to rescue undamaged sectors from a corrupted disc by saving to a second disc.

Fault Line Graphics

Peter Whitaker demonstrates hidden line removal with a program which generates complex landscape graphics.

Mission Impossible

David Berry sets out the targets and leaves you to line up the rights.

Concealing Data

Extra security is derived from encoding text so that it can't be read without a key. Denis Bellingham unveils the principles.

News Extra

New utility from Haris Micro Software — and static devices.

Mode 24

True lower case, underline, inverse text, hi res plots, courtesy of Paul Wales.

Quick GLS

A short mac routine for clearing graphics quickly.

Arcade Arena

The Expert flies the copter a second fall — the only clue we have is a map of Castle Snatch (part 1).

Dragon Answers

Beats and bits — a loose connection — music from beeps — where is the CC register? — random access file setting.

Adventure Trial

The secrets of Juxtaposition unlocked.

Competition

Add up letters to make a number and win a copy of Boulder Crash.

Editorial

Last month's bargain cards have been stripped as if by locusts, and dealers with cheap hardware report that it's going fast. We have so many questions to answer that we're running a page of Communication this month. New subscriptions are still flowing in, and we get plenty of suggestions as well.

Sometimes we can pull out of the hat the very article which scores of readers have been requesting; sometimes we can't but we keep trying. We would like to do that sound up of printers, but we won't publish anything which hasn't been tested by a Dragon User — so if you have recently installed a new printer, get in touch. You may be able to help DU.

Do you write? As well as original ideas from contributors, we often have a pile of suggestions looking for a voice-wright. Tell me who you are and what you can do, and I'll send you the next requests list.

I'll be setting aside a page for programming tips soon, so we want to hear from anyone who thinks their solution is neater and more elegant (or just more useful) than the run of the mill. This can be planning and designing as well as routines. The Dragon Can Do, so tell us what it's doing for you.

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(All repeat words)
01-437 4343

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How to submit articles

The quality of the material we can publish in Dragon User each month will, to a very great extent, depend on the quality of the submissions that you can make with your Dragon. The Dragon computer was launched on to the market with a powerful version of Basic, but with very poor documentation.

Articles which are submitted to Dragon User for publication should not be more than 2000 words long. All submissions should be typed. Please leave a wide margin and a double space between each line. Programs should, wherever possible, be prepared printed on plain white paper and be accompanied by a tape of the program.

We cannot guarantee to return every submitted article or program, so please keep a copy. If you want to have your program returned you must include a stamped addressed envelope.

Letters

Seeing is deleting

I HAVE discovered that the Dragon in BASIC mode saves the rest of the text in the cursor position whenever you hit the "T" key and get into INPUT mode.

This gives you the facility of deleting unwanted characters by using the left arrow key instead of counting in characters for edit. You simply move the cursor to the first character you wish to retain, after the characters to be deleted, then enter INPUT mode and finally hit the left arrow key until the first character to be retained is reached. This gives you visible control of what you're deleting.

Tommy Grand
Hastingsdon 130
WABCO MOI RANZ
Norway

Line feed switch

MY interest was aroused by "New Line" in Dragon Answers, August 1988. The Siskosha GEMMOK Mark 2, which I used, has four small switches inside the cover. When the printer leaves the factory all four switches are in the OFF position. The third switch controls line feed, and is put in the ON position to obtain line feed. This is dealt with in the maker's manual, and mentioned in an article in DU July 1983, page 17.

Eric Stage
28 Antford Road
Bilston
Carmar DU3 3Q4

FC error found

THEIR is something quite like using information from one's own article and finding it to be in error... I was setting up a numeric POKE value in a BASIC program for use in a machine code routine as per the technique on page 21 of the March 1988 DU, and four values larger than 32767 an FC error occurs

when using the 3263 255 technique at the top of the page. For unsigned, double byte values that may exceed 32767, the least significant byte of any variable N can be obtained by: POKE PO+1, N-(INT (N/256)*256)

Signed values -1 to -32768 will suffer a similar fate so: POKE PO+1, 256*P-(INT (256*P/256)*256) will be needed. This was the technique I had always used until adopting the shorter NAD 255* statement!

Pam Darcy
21 Wycombe Lane
Woodcum Green
High Wycombe

Ideas for Israel?

I AM the head manager of the Israeli Dragon Users Club. Our club is a profit club, so wanted to join an adult club but there is no such club in Israel, so we decided to build our own club. We would like to hear from our Dragon users with ideas on how to run a club.

Januar Sagay
Hemod 177
P.O. Box 44444
Israel

Helpful sounds

IN THE course of writing some simple Basic programs for children with mental handicaps, a recurring problem was the inability to read instructions on the screen by children who were unable to follow verbal instructions. A solution was found in recording the instructions verbatim on the tape directly after the program, timing the speech with a stop watch. Then all that is needed is a MOTOR ON/AUDIO ON command in the program, followed by a suitable pause, provided by the Dragon's built-in timer, on a four-note loop. After some adjustment the lengths of the loops were adjusted as follows:
1 to 7650 = 3 seconds; 1 to 7660 = 5 seconds; 1 to 7680 = 10 seconds; 1 to 7690 = 15 seconds; 1 to 74150 = 20

seconds; 1 to 75600 = 30 seconds.

A four-note loop must be used if the time has already been set as part of the program. If the pause is set slightly longer than the instructions, then the MOTOR OFF/AUDIO OFF command can be followed by a tone to indicate when to start the game just like those horrible telephone answering machines. Of course, reminders to switch off the "play" button on the recorder would be a good idea as well.

Using this method, perhaps some real sounds could be incorporated into games without the pauses. I rigged a cassette with a continuous loop to play some recorded galloping noises for a horse-shoe game, the possibilities for adding sounds, music or speech into programs are only limited by the length of the cassette tape using this method, unless a continuous loop is rigged in a separate cassette.

Stuart Beardslee
1 West Gorton
Alders Lane
Notwood
Gowerly Bridge
Midst Thryk

Elusive computer

IN THE editorial from September 1988 you mentioned that Burkhard were trying to produce a DRK Dragon with hard discs and Pico. Do you have any more information? Also, my back in July 1984 GEC brought out a new Dragon, called the Professional, and a couple of people were advertising it for £699 inc. VAT. When I rang Commodore Computers last year they told me the Professional never made it to the open market. Is this true or is there any chance of obtaining one?

G.C. Bailey
9 Draycott House
Ditch Hall Lane
Longfirth
Manchester

BURKHARD have not produced any new models that we know of in the last twelve months; the only effective way of getting a DRK Dragon is with a hard-disc add-on. We

had pictures of the Professional many months ago, but we never saw a live one. If any did make it on the market, they will be in private hands by now. Does anyone know more about the Professional?

Lack of data

IN THE August edition you featured "Screen Designer" by Dennis May. An interesting and revealing program. There was one snag, however. Those of us who do not possess an Altair micro-assembly and had to POKE in the data found that the "Shifting Screen" featured in Listing 4 would not work because of insufficient data.

On close close examination I find that the following appears to have been omitted:

0688 73 83 75 85 85 85
0689 73 83 75 85 85 85
06C0 00
06C2 87 91 72 80 74 8F

In the main assembly listing (2), two items appear to have been left:

705E 32
70C4 72

I wish you and Dragon User every success and I hope that you obtain the support you deserve, not only from subscribers, but from advertisers as well.

Ray Smith
9 Dean Road
Parkstone
Poole
Dorset

Change of address

THANK YOU for publishing my article for the "Touchmaster Graphics Tablet. As I have moved, the address in this article is no longer correct.

For those without a letterbox, I can supply any of my programs from Dragon over at the original price of £3.00 each. These include the Microprocessor (plus tape), machine code monitor, GEMFest and the graphics tablet program.

Peter Whitaker
c/o 126 Coventry Road
Mansfield
Nottinghamshire
CV10 2BD

News desk

If you have any new products for the Dragon — software or hardware — ring the News Desk on 01-437 4343

User Group

THE National Dragon Users Group tell us that their monthly newsletter Dragon Update is up to its 34th issue, and that their membership is increasing steadily since they formed in 1984 to combat rumours that the Dragon was dead.

The NDUG has members overseas as well as in the UK, and encourages other newsletters to reprint their articles and reviews. Dragon Update prints reviews, news, practical information about software and hardware, and readers' programmes. 'Anyone in the group is

likely to be picked on at any time to do just about anything... we try to balance things so that we cover all Dragon related interests, so that there is something for everyone... the subscription covers only essentials such as printing, postage, phone calls etc.'

Subscriptions are £5 annually, £9 overseas, from Paul Gaskie (Chairman) at Naxosine, Rold, Worthing, Sussex. NDUG is usually represented at national shows, so look for them next time.

Disc editing utility

PAIDCOMMS have produced a new utility for editing machine code programs. Source-maker disassemblers, memory to DragonDOS disc in the format DPG2DREAM, Source Code Data File, which can then be loaded into DPG2DREAM for subsequent editing and reassembly. It is said, says Paul D'Arcy, for tailoring the files of the hex dumps which appear in DU to one's own system and personal tastes. It is also helpful in editing software, particularly in changing from cassette to a disc based system, where sup-

port is not available from the Source-maker with User Guide and a Master and Work Discs is available at £180 inc. vat, £180 overseas, all inclusive, and as a cassette based system shortly at the same price. This version will work in conjunction with all the DREAM packages (ALLOREAM cartridge, cassette, CodaDOS, DREAM cassette, DREAM and DREAM BUS cassette).

Orders and enquiries to Paidcomms Ltd., 21 Wycombe Lane, Wycombe Green, High Wycombe, Bucks HP12 3JG.

Radio Dragon

PERKSOFT tell Dragon User that they have assisted supplies of Dragon power supplies and individual transformers. Says Harry Whitehouse: 'There has been a shortage of the original product for some time. As a result, we commissioned the design and manufacture of a new, heavy duty replacement. As a service to the Dragon community which has supported us for the best part of four years, we settle our stocks at heavy loss, in order that everyone can keep their Dragons in action.' The complete power supply costs £78.95, with two years' guarantee. For information contact Perksoft at 48 Queen St., Balderton, Newark, Notts.

NGG4 (Int. Tel. 0606) 705290.

Perksoft also have a service of interest to radio amateurs. Radio Dragon is an electronic magazine which costs the user 30 hours a week. Dragon and Tandy users with modems can download the whole magazine with a 2-3 minute cheap rates phone call, and then save, print or just read it through. It's free of charge, and does not take paid advertising, but will mention new services.

Not Washed

PART of a line is missing from line 680 of last month's Core Issue: the missing characters are <crashed> to complete the phrase 'The rest have not crashed.'

Dragon dance

MARIDIAN, the software house which produced Intabase and Spellbox last year, have three new packages on the market.

'Underbeings of Craft' is an adventure which begins in a deep pit where a hapless adventurer is imprisoned in an iron cage. His mission is to turn and guide him to the surface. The game uses upper and lower case text, 66 locations and 165 words, and can be saved. The price is £205.

'Decation' is a ten-game competition for one to five players, including Anagram, Hangman, Shootout, Spider, etc. The games are designed

to suit people of different abilities and are good for parties, train the makers. The price is again £2.85.

Something a little different for the music buff, 'Incariously transcribed' four part harmony renditions of music by Bach and Scott Joplin, which can be played through the Dragon using its own sound capabilities, and routed through a hi-fi if the user wishes. The two-disc and one-disc tapes cost £3.95 each, £2.85 the set.

Orders and enquiries to Maridian, Broomers Cottage, Hawthorn Lane, Prestonoid, Great Missenden, Bucks HP16 0DD.

Show releases

BLAHY COMPUTER Games have added a fruit machine game to the three new releases (Fun, Blasty-Crash and Simple of Doom) which they are releasing at the Dragon Computer Show in Cardiff in October (information about the show from John.Peter.computers@britain (0400) 5076). 'And anything else has been finished at the time', says John Blahy.

Blahy also have a cache of working and non-working Dragons to sell, which they will be bringing to the show in London (November) and Cardiff (they do transformations as well).

Knechtel Knews

BERNARD KNECHTEL Software introduces a new price and method of payment for their Disk Support Tool (DST) package on disk. The software is £700 inc. postage and packing; payment can now be made by postal order (Bernie is not entirely clear whether this includes cheques and money orders, if sending a Post Office postal order, it should be crossed for security) instead of direct transfer.

We hope to be printing a

review of DST soon. When ordering, please state which version of DragonDOS you are using, and attach your name and address separately to both your order and your postal order.

Order and enquiries to Bernard Knechtel, Arnoval Matthews St. 8, 5030 Parnassos, West Germany.

Even cheaper

PERKSOFT, CONTRIBUTORS, who last month put a collection of working and non-working Dragon 32s up for sale at their north London warehouse, report that the units have been selling well, and that they are slating the price of the non-working, spares-only units still left at £10 each.

The warehouse is at the Haybridge Estate, Castle Road, Camden Town, London NW1; for information and phone (credit card) sales phone 071 267 5911.

Dragon date

OWING to the change in distribution, Dragon User will now be delivered in the last week of the month prior to the cover date.

News Desk — Page 9

Dragon User People's Chart

DELLAS, Texas: in the multi-story offices of Being Oil, wide shouldered Personal Secretaries glide silently between wide, gleaming executive desks across wide examples of whitewashing carpet. In the panelled suite occupied by J. R. Being, J.R. himself takes down hand upon a wide cigar as he peruses a file deposited by one of those creatures.

"Whaddya mean, takeover (ed)? filth. In hell is this Wintersoft, anyway? Part of KCI? Goddam nerve!"

"Sir!" breathes the vision. "The latest report has just arrived. Finance are convinced that Wintersoft's may be in a stronger position than we imagined."

"Like what?"

"Well, sir, Juxtaposition—Starting of Dell I has topped the Dragon User People's Chart for the third month."

At this point J.R. bites his cigar in half. J.R.'s nerves will be jangled still further by Mr Robert Glassman of Dorset, who today states "Have fired, get a Dragon, it's enemy for Mr". Mr. Glassman wins our program contest.

Yes, you can win £25-worth of software from Microdeal if you can devise an interestingly witty sentence from the letters (or some of them) in the titles of your favourite three Dragon software packages. To do this, of course, you have to list your favourites—five, in fact, in that form to your right (or left) and send them to us. It's a game!

Results September 1986

- 1 Juxtaposition.....(Wintersoft)
- 2 Shock Trooper.....(Microdeal)
- 3 Total Eclipse.....(Eclipse Fenmar)
- 4 Moon Cresta.....(Incentive)
- 5 Syzygy.....(Microdeal)

Chart Eight

Wintersoft Chart No.8 issues at 11pm on Friday, 17th October 1986. Entries received after that time will not be eligible for inclusion in that month's voting. The editor's decision is final. Only one entry per individual per month will be allowed.

My top 5: Voting Month 7

	Name
1	Address
2	
3	
4	
5	

My phrase is:

Dragonsoft

New software for review should be sent to Dragon User, 12-13 Little Newport Street, London WC2H 7PP.

Fifty and out...

Program: Cascade 50.
Supplier: Cascade Games, c/o Players Cascard, Harrogate, N. Yorks.
Price: £5.95

WHEN this cassette came out many years ago, I remember thinking to myself, "It can't be? 50 games on one cassette? They must all be atrocious!" Through time though, I mellowed and gained a different view of humanity. I felt that maybe humanity was inherently good, maybe the cassette had some good stuff on it.

A few months later now we buying the "Fabulous" Cascade 10.

I rushed home, set up Oxyg (my computer) and loaded the two games. Maze later, it wasn't very good. In fact it was written in BASIC and didn't really look very nice. In fact it was awful. But what did I

care... I still had 49 games to go.

I loaded the second game, Galactic Attack. It wasn't really very good. In fact it was written in BASIC and didn't really look very nice. In fact it was awful. But what did I care... I still had 48 games to go!

Three hours later I loaded the last game, Exchange. It wasn't really very good, etc.

I was not a happy person. Dizzy and myself had had a great time loading fifty totally useless games.

All the games were in BASIC, although some were native Dragon (BASIC) — one of the games would not run as it was written in ZX-41 BASIC.

No attempt whatsoever was made at text formatting so the games looked as bad as they played.

May I congratulate Cascade Software on producing fifteen or two but fifty unplayable games.

Jason Orbaum



Justified writer

Program: Electronic Author Supplier: Smithson Computing. Price: £14.95. cassette, £19.95 disk.

THIS review is like no other I have ever written, for it was written on a new and better word-processor than the old-fashioned Telewriter. Yes, sure, Telewriter is a fine word Processor, it's just that Smithson's Electronic Author is better.

The format is text window and command window. The text window is either 51 or 64 character-wide dependent on user choice, and twenty lines deep. The command window is two lines and allows input of the abbreviated commands to control 80 functions and text manipulation.

The keyboard scan doesn't appear to miss letters, even, and the text, even with 64 characters a line is clear, neat, and pleasant to read.

In theory, the E-side's "Canfig" program should allow the WP to work with any printer, it works fine with my Kenexa, but I'm having trouble trying to get the printing to work! It's a tape based WP but a Dragon-Dos version is available and a Delta Version is currently in production.

All the usual features: Search and replace (selective and global), block move, copy, and delete, word count, etc. are very easy to operate. The program also has come up on an unpatched Telewriter in that it has a right justification mode built into it so that it is possible to have your text printed in clear blocks without a jagged right hand margin.

All in all, I like this word-processor and will now be using it instead of Telewriter. It would be nice to see word-wrap incorporated in an option.

Jason Orbaum



Communication

Send in your questions, requests, and pleas to Communication, Dragon User, 12-13 Little Newport Street, London WC2.

Problem: Can anyone help us with software/hardware/special adaptations suitable for use by children with physical and mental handicaps? We have been given a Dragon 32 and cassette recorder, but cannot find any of the above. We call our Dragon "Puff", can someone provide some advice? Can he be sound-operated by wiring up a microphone? Can he talk to us? Any offers of help/ideas gratefully accepted.
Enquirer: Stuart Boardman, 20 Weymouth Children's Home, 35 Victoria Road, Epsom, West Yorkshire.

Problem: What were the functions of the ROM routines at addresses 38020, 3C020, 34020, 35020? What are the fairly equivalent?

Enquirer: Paul Marlow, 90 Little Avenue, Berles, Watford, West Midlands WD2 6UP.

Problem: Could anybody help me in securing a circuit diagram for an EPROM burner for the Dragon 32?

Enquirer: Philip G. Kenney, 49 Clives, Gosport, Hampshire, SO10 6TP 444.

Problem: Is there anyone in Edinburgh who has a Dragon 32K who is willing to exchange games, etc?

Enquirer: Ryan Henderson, 2 East Clapperfield, Edinburgh, Scotland EH6 2TU.

Problem: Is there anyone out there who is willing to print out listings of basic programs for a Dragon User with no printer?

Enquirer: T. Jenkins, Llys Helys, Newport, Pembrokeshire SA42 0GZ.

Problem: Does anyone have or know about the Superchip card? Does anyone know of a TRS-Dragon computer for MC Press, does it exist or is a myth?
Enquirer: Ian Pickett, 2 Pionade Road, Hurley, Leeds, Yorkshire LS4 3PL.

Problem: Is anyone using a Dragon 32 for duplicate bridge scoring?

Enquirer: I.W. Cox, 16 Tibury Road, Rushmore, Kent ME9 7PW.

Problem: I need to buy or borrow (all post paid) the following Dragon Users: June 1983, July 1983, August 1983, September 1983; also, has anybody got the demonstration 1-7 from Sprite Magic. I keep getting mistakes in lines 29 or 30 and I need one that works.

Enquirer: Dennis Gates, 184 Bels Road, Newton Hall Est., Durham, DH1 5LH.

Problem: Could you please tell me how to achieve a scrolling effect in Basic, on the Hires screen, as in games such as Symbio, Speed Race etc.
Enquirer: Steve Davis, 60 Valley View, Lomington, Newcastle-upon-Tyne.

Problem: Would coupling two Dragon 32s together produce extra memory in more than the 256 already available? If so, how do I do the link up?

Enquirer: J. D. Wall, Stone Gables, Clarendon Road, Datchet, SL4 3JS.

Problem: I have owned a Smith Corona Speedcast 80 printer since Christmas, and have found it to be a bargain at around £100, however the manual is not clear on the production of graphics. I have tried several screen dumps and none of them work satisfactorily. I would also like to know how to load a program from DragonDOS using the Boot command.
Enquirer: Sherry Baker, 24 Carroll Drive, Longon, Stoke-on-Trent, Staffs ST3 1SF.

Problem: I have got Speed Race, but because I have a self centering joystick, sometimes I try to get track 3, I just get track 1, 3 or 4 instead. If anyone has any hints please write.
Enquirer: G. Minto, c/o WCE (SSA), Mily, H. G. Squabron, 7th Sig. Reg., 6PPO 15.

Problem: I have a CPM-86 printer, but I don't have a program for dumping graphics onto it the right way up. Please help me because it is not very useful having a printer with pictures sideways on it.
Enquirer: Nicholas Parker, 15 Rattlefield Road, St. Albans, Herts AL1 4DA.

Problem: Is there any way I can adapt Microsoft's Backgammon game to work with my Trojan Lights Pen, as the game has a light pen facility?

Enquirer: Daniel Street, 41 College Drive, Gates, Aylesbury Bucks HP8 9QZ.

Problem: I have a Tandy 03P415. How do I dump the hires screen to the printer, is it a matter of a few simple codes, or do I have to buy some software? If so, where do I buy it?

Enquirer: G. S. Phillips, 10 Broadstone Hall Road South, South Heston, Stockport, Cheshire SK5 7DG.

Problem: I have a Dragon 32 and an alphascan printer with an interface for a Spectrum. Can anyone tell me if the printer is compatible with the Dragon, and how I can wire it to a suitable socket? I have a ctronics cable, but when I remove the interface board the printer will be left with a bundle of wires and I don't know how to match them up with the cable. Can anybody send me a wiring diagram or help in any way please.

Enquirer: R. Burrows, 134 Parkfield St., Rusholme M4 4 3PT.

Problem: I have a small program about 2K which is in Basic and occupies lines 1 to 47 consecutively, and which has a fixed number (100+) of data lines.

attached to it, starting at line 100, making the total memory in excess of 2K. I used POKE 255,NEW to enable this large use of data. I tried to REM,NEW 100,NEW the whole program, and got RD ERROR. My four year old manual did not help, and I could not retrieve the program and had to CLOAD again. I checked the memory and found 62 left. By removing comments and leaving 500 bytes in memory, the REM,NEW worked. Could anyone explain what RD ERROR is and how to avoid it, using all available memory?

Enquirer: Alastair Gurr, 156 Folly Lane, St. Albans, Herts AL3 5JG.

Problem: Could anybody help a TRS CoCo 32S carrier with the conversion of the Writer program (May 83) and the Windows program (July 83) from Dragon format, especially the EXOC ADDRESS or DATA statement changes. Would also like to know if anyone is willing to sell their July 1983 issue, 5/80 and 10/80 others - £10.

Enquirer: Edward Preece, 31 Ashton Lane, Severn Beach, Bristol BS33 3PP.

Problem: Is there a Stockport or South Manchester Dragon Club?

Enquirer: Keith Cresswell, 51 Weston Ave., Heston Chapel, Stockport, Cheshire SK4 5JT.

Problem: I am looking for a copy of the Computational voice synthesizer program by Dragon Data.

Enquirer: John Campbell-Pearce, 12 Stait Street, Treharn, Rhondda, Mid Glamorgan, CF4 2PP.

Problem: I have a Dragon 32 converted to 64 and am puzzled by not being able to find the maximum (?) memory in 64 Mode, also I have been given a Hitachi compact floppy, disc drive model HD 3004 (4K5 Drive) and was wondering if anyone knew how to use it with the Dragon.

Enquirer: Mr. R. E. Paterson, 35 Lodge Oak Lane, Tordridge, Kent TN11 2EG.

Problem: I am a frustrated Dragonite with no printer. There used to be adverts for people who would print out listings for you, but I can't find any now. Do you know anyone with a suitable printer who would do this service?

Enquirer: T. Jenkins, Llys Helys, Newport, Pembrokeshire, SA42 0GZ.

Problem: What is RTTY and could I have some information on amateur radio?

Enquirer: R. Vaughan, 189 Port Tennant Road, Port Tennant, Swansea, W. Glamorgan SA1 5LJ.

Communication

Stuck for a routine? Need some obscure equipment? Feeling out of it? Fear not — someone, somewhere can help you! Write down your problem on the coupon below (make it as brief and legible as possible) together with your name and address and send it to Communication, Dragon User, 12/13 Little Newport Street, London WC2H 7PP. We'll publish it as soon as we can — meanwhile, maybe there's someone who can help this month!

Problem

.....

Name

Address

.....

Disc rescue

Pam D'Arcy rescues good sectors from a corrupted disc.

HAVING purchased a second-hand pair of 40-track single-sided drives at a bargain price (despite a round trip of 250 miles), a spate of RP prices followed making me feel that perhaps they weren't such a good bargain after all. This was in particular badly timed, problem as it presented essential BACKUPS being taken of discs full of new clumps of some contract work that I was testing on the Dragon. Of necessity, I quickly produced a few lines of BASIC to copy all the readable sectors of an affected disc to a newly formatted disc on the second drive. I have since added additional options, including single drive working, to produce DISKBLISS (Disk Back Up Good Sectors). Although it will now form part of my Disk-BUT package (RTO + 50p RSP — hence the casual 'bravissimo'), it is such a short but useful program that I cannot resist sharing it even with non-purchasers of DISK-BUT.

It has only been tested on 40 track single-sided, single and dual drives and cannot yet our 60 track double-sided system to func-

tion satisfactorily on the Dragon, but optional parameters are built into it for 40/60 single/double sided single/multiple drive operation. In order to cater for single drive users, 72 consecutive sectors (4 single-sided drive tracks) of data are read into 30 and 75 arrays between disc swaps, thus requiring 10 disc changes for a 40 track single-sided back-up — not much worse than BACKUP itself and pretty good, I feel, for a BASIC program. The occasional apparent 'fossilisation' in reading in BASIC's garbage often strings black taking place (32 sectors needs 18K of string stack at a time).

When reporting disc errors, no screen paging is included for those without printers. The error reports scroll from the bottom of the screen, there being ample time for them to be noted on paper before they disappear should there be a large number of them.

To ensure that the destination disc is error free before commencing the back up, DISKBLISS has a pre-copy option. Users of

single-sided 60 track systems will recognise lines 380-400 as being the guts of the 'pre-copy program' supplied by Dragon Data to correct the wrongly set up sector bit map.

A sector of ASCII space characters is written to the destination disc in place of sectors unable to be read from the source disc. Should the faulty sector have occurred in the middle of a BASIC program, LOADING and LISTING the program from the new disc after DISKBLISS has finished will probably show a wildly excessive line number preceding a number of space lines on the screen. DELETE the offending line number and as much as possible of an affected BASIC program will have been rescued.

When initially typing/testing programs containing automatic error handling (eg line 20 ERROR GOTO 60), it is often easier to start off by temporarily REMarking out such lines, although it is obviously an essential part of the program once you are happy that it seems to be typed in correctly. DISKBLISS program listing attached.

```

10 REM DISKBLISS (DISK Back Up Good Sectors) LRS, 10/10/80
110 REM: PROGRAMS: DISKBLISS, DISKBLISS.DAT, DISKBLISS.DOC
120 REM: END OF DISKBLISS (preparation back up good sectors)
130 DIM A$(10000)
140 PRINT "DISKBLISS (DISK Back Up Good Sectors) LRS, 10/10/80"
150 DIM S$(10000), T$(10000), U$(10000), V$(10000), W$(10000), X$(10000), Y$(10000), Z$(10000)
160 DIM S$(10000), T$(10000), U$(10000), V$(10000), W$(10000), X$(10000), Y$(10000), Z$(10000)
170 DIM S$(10000), T$(10000), U$(10000), V$(10000), W$(10000), X$(10000), Y$(10000), Z$(10000)
180 PRINT "DISKBLISS (DISK Back Up Good Sectors) LRS, 10/10/80"
190 DIM S$(10000), T$(10000), U$(10000), V$(10000), W$(10000), X$(10000), Y$(10000), Z$(10000)
200 PRINT "DISKBLISS (DISK Back Up Good Sectors) LRS, 10/10/80"
210 DIM S$(10000), T$(10000), U$(10000), V$(10000), W$(10000), X$(10000), Y$(10000), Z$(10000)
220 PRINT "DISKBLISS (DISK Back Up Good Sectors) LRS, 10/10/80"
230 DIM S$(10000), T$(10000), U$(10000), V$(10000), W$(10000), X$(10000), Y$(10000), Z$(10000)
240 PRINT "DISKBLISS (DISK Back Up Good Sectors) LRS, 10/10/80"
250 DIM S$(10000), T$(10000), U$(10000), V$(10000), W$(10000), X$(10000), Y$(10000), Z$(10000)
260 PRINT "DISKBLISS (DISK Back Up Good Sectors) LRS, 10/10/80"
270 DIM S$(10000), T$(10000), U$(10000), V$(10000), W$(10000), X$(10000), Y$(10000), Z$(10000)
280 PRINT "DISKBLISS (DISK Back Up Good Sectors) LRS, 10/10/80"
290 DIM S$(10000), T$(10000), U$(10000), V$(10000), W$(10000), X$(10000), Y$(10000), Z$(10000)
300 PRINT "DISKBLISS (DISK Back Up Good Sectors) LRS, 10/10/80"
310 DIM S$(10000), T$(10000), U$(10000), V$(10000), W$(10000), X$(10000), Y$(10000), Z$(10000)
320 PRINT "DISKBLISS (DISK Back Up Good Sectors) LRS, 10/10/80"
330 DIM S$(10000), T$(10000), U$(10000), V$(10000), W$(10000), X$(10000), Y$(10000), Z$(10000)
340 PRINT "DISKBLISS (DISK Back Up Good Sectors) LRS, 10/10/80"
350 DIM S$(10000), T$(10000), U$(10000), V$(10000), W$(10000), X$(10000), Y$(10000), Z$(10000)
360 PRINT "DISKBLISS (DISK Back Up Good Sectors) LRS, 10/10/80"
370 DIM S$(10000), T$(10000), U$(10000), V$(10000), W$(10000), X$(10000), Y$(10000), Z$(10000)
380 PRINT "DISKBLISS (DISK Back Up Good Sectors) LRS, 10/10/80"
390 DIM S$(10000), T$(10000), U$(10000), V$(10000), W$(10000), X$(10000), Y$(10000), Z$(10000)
400 PRINT "DISKBLISS (DISK Back Up Good Sectors) LRS, 10/10/80"
410 DIM S$(10000), T$(10000), U$(10000), V$(10000), W$(10000), X$(10000), Y$(10000), Z$(10000)
420 PRINT "DISKBLISS (DISK Back Up Good Sectors) LRS, 10/10/80"
430 DIM S$(10000), T$(10000), U$(10000), V$(10000), W$(10000), X$(10000), Y$(10000), Z$(10000)
440 PRINT "DISKBLISS (DISK Back Up Good Sectors) LRS, 10/10/80"
450 DIM S$(10000), T$(10000), U$(10000), V$(10000), W$(10000), X$(10000), Y$(10000), Z$(10000)
460 PRINT "DISKBLISS (DISK Back Up Good Sectors) LRS, 10/10/80"
470 DIM S$(10000), T$(10000), U$(10000), V$(10000), W$(10000), X$(10000), Y$(10000), Z$(10000)

```


Fault Line

Create a landscape with this program by P. Whittaker

BACK IN the February issue of Dragon User, I wrote an article on Three-Dimensional Graphics for the Dragon. Although I dealt with the equations needed for the rotation and manipulation of 3D objects, I did not cover the subject of hidden line removal. As a result, the objects drawn tended to look as though they were made of chicken-wire, and were often hard to understand. To draw more solid looking objects we need to devise a way of removing the lines which show through from the back of the object, and pass up the display. Such a technique is called Hidden-Line Removal.

Flat surface

FAULT LINE (MACH-III) is a program which generates artificial landscapes from a flat surface, and demonstrates one easy method of 'Hidden Line Removal'. The program works by generating a number of random fault lines across the face of the landscape, and moving the opposite sides of the fault-line either up or down a small distance. After sufficient faults have been developed, a fully landscape will develop. If the process

several can be selected later. Pressing the [Alt] key will return to the menu screen, whilst any of the other keys will call the appropriate routines.

If the landscape has not developed sufficiently, press the [C] key, and you can generate a few more fault lines.

Once a landscape has been generated, it can be saved to disc by pressing the [S] key. It can be reloaded at a later date by pressing the [L] key. When the landscape data is saved, the first piece of data is the size of the arrays. This is so that the load routine can cope with different sized landscapes. Whenever the data is reloaded, the program will know what size of array it is dealing with.

The remaining functions all deal with the details of the landscape display. Pressing the [F] key will fill in the sea, at all locations below the baseline level of the landscape. The landscape will be redrawn using hidden-line removal, but this time the tide will have come in, and the deepest valleys will have disappeared. This will often make it easier to get a feel for the shape of the land. In a similar way, pressing the [R] key will also redraw the landscape using

64K mode. These arrays can be made bigger, which will allow for larger grids to be used. The X and Y arrays are used to store the landscape data, whilst the Z and Y2 arrays are used to store the modified landscape data used when drawing the display.

When a landscape is generated (F50) the program first asks for the grid size, and the number of faults. A flat surface is calculated to fill the grid (320-370), and then this surface is manipulated by each of the faultlines. This generated grid is calculated to hold the screen co-ordinates of the landscape, and these co-ordinates are directly manipulated by the program. This will give us having to make later perspective calculations. Each faultline is generated by randomly choosing two points on the surface. From these points (X1, Y1) and (X2, Y2) we can calculate the equation of the faultline, $AX + B = Y$ (380-390). Then another couple of random numbers are picked to decide which side of the lines will be moved up or down. (390-430) The computer will then scan through the arrays and modify the vertical component of each point on the line to the appropriate side of the fault line.

The equation for a straight line uses the formula $AX + B = Y$. With two values for X and Y, we can calculate the values of A and B, and so derive the equation of the line itself. $A = (Y1 - Y2) / (X1 - X2)$ and $B = Y1 - AY1$. Then, once we have this line equation, we can test all of the points on the grid surface to see if they fall above or below the line. Inserting the X value in the equation, we generate a Y value. If this is greater than the Y value of our co-ordinate, then we know that it is below the line. Similarly, if it is smaller, then the co-ordinate is above the line. In this manner, we can discover on which side of the fault line each co-ordinate is, and move it up or down accordingly.

The landscape is then drawn out on the PMODE4 screen, and then displayed to the PMODE4.1 screen (450-550). Whenever the landscape is drawn in as a wire frame, the programmer uses the main arrays (X) and (Y). When the landscape is drawn using hidden line removal the secondary arrays (Z) are used. This is because the F fill sea routine modifies the array data, and would not allow for the R (refresh) or C (continue) functions if it used the main arrays.

Routines

The F fill routine reads through the data in the main arrays (550-600), and if it finds any co-ordinates which fall below the grid baseline, it sets them to that base line level. All of these co-ordinates are copied into the secondary arrays for display. The P (refresh) routine works by copying the original arrays across into the secondary display arrays. Both of these routines load automatically into the 3D-solid display routine (580-680). This draws in the landscape starting with the furthest back parts, and working

Fig.1 Blank lines to point out a segment



Fig.2 Segment fully painted Any background obliterated



is continued, the landscape will continue to get more and more pointed and mountainous.

When RUN an options list will be displayed, press the [R] key to generate a new landscape. The computer will then ask for grid size for the landscape. This can be up to about 35 on a Dragon 32, but can be higher if on a Dragon 1 or Dragon 50. Then the computer will ask for the number of faults to generate. The landscape is drawn on the PMODE4.1 graphics screen, and displayed on the PMODE4.1 screen. The display is updated each time the results of a new faultline are calculated. Whilst the landscape is being generated the display will be in green, but once the final landscape has been drawn, the display will change to white. However, at this stage, the display will still be in the usual 'wire frame' style, and will be seen through. The hidden-line

removal will be seen, but this time will draw it with the tide out.

If the landscape has developed in such a way that it is all either under the sea, or all above it, then it can be raised or lowered by pressing the [V] key, and then entering the vertical offset for the display. When this recalculation is finished, the programme will return to the menu screen. To draw in a new landscape, you will need to press either the [F] or [R] keys.

Once you are happy with the landscape, the display can be saved by pressing the [S] key. This is currently set up for disc, so tape users will need to change the command from SAVE AS 3070 3016, 4194 to CSAFEM 401106, 5880, 41194.

The program makes use of two sets of arrays (X) and (Y), and (Z) and (Y2). These are dimensioned at the start of the program. If you are using a Dragon without disc, or in

towards the front of the display. In this way the closer parts of the landscape are drawn over the areas behind, and any hidden lines get removed. To make sure that these hidden lines are indeed covered, the landscape is redrawn in a new frame, but as solid. The space between each line of the wireframe is filled with black lines, painting out anything underneath.

This is done by once again using the $Y=AX+B$ equation. This time we use the

corner co-ordinates for the two points from which we generate the line equation (Fig. 1). The program will first calculate the equation of the line from corner 'A' to corner 'B'. Then it will draw a black line from each point on that line to corner 'C'. (This is done by inserting the range of possible X values between corners 'A' and 'B' into the line equation.) When this is done, the program will work out the equation for the line between 'C' and 'D' and then draw a black line from

each point on this line to corner 'B' (Fig. 2). Then finally, the program will close in the outline A-B-C-D in white. By doing this, and working from the back of the display object towards the front, we can make any object appear solid. We are in effect displaying a solid black object with white contour lines on its surface to make it visible. Using this technique, it should be possible to draw any object on screen, giving it a solid appearance.



```

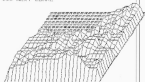
40 AA=INKEY$:IF AA="" THEN GO
50 IF AA="M" THEN 20
60 IF AA="0" THEN 160
70 IF AA="C" THEN PRODE4,0:INPUT"NU
  MBER OF EXTRA FAULTS":O:GOTO260
80 IF AA="S" THEN 930
90 IF AA="L" THEN 1060
100 IF AA="B" THEN 1160
110 IF AA="P" THEN 830
120 IF AA="R" THEN 940
130 IF AA="V" THEN 930
150 GOTO20
160 FORS=490,0
170 A=RPD(L-TIMER)
180 CLS:PRINTG260,"FAULT LINE MACH
  NE":PRINT
190 PRODE4,0:PCLS
200 INPUT"SIDE OF GRID":SIDE
210 INPUT"NUMBER OF FAULT LINES":O
220 FOR A=0 TO SIDE:FOR B=0 TO SIDE
230 V=120/(SIDE)
240 H=2*(230/(SIDE)*3)
250 Y(A,B)=100-B*V
260 X(A,B)=10+G*H+B*H/2
270 NEXT B,A
280 SCREEN1,0
290 FOR QU=ES=1 TO O
300 X1=RPD(SIDE-1):X2=RPD(SIDE-1):Y
  1=RPD(SIDE-1):Y2=RPD(SIDE-1)
310 IF X1=X2 THEN 360
320 IF Y1=Y2 THEN 360
330 IF X1=X2 THEN 360
340 *****EXTRACTION = G*H+B*Y *****
350 A=(Y1-Y2)/(X1-X2)
360 B=Y1-(A*X1)

```

```

10 POLDERR:DIR #120,250,Y(25,25),X2
  (25,25),Y2(25,25)
20 CLS:PRINTG6,"FAULT LINE MACHINE"
  :PRINT:PRINTG6,...GENERATE FAUL
  T LINES...:PRINTG6,...CONTINUE F
  AULT GENERATION...:PRINTG6,...SA
  VE LAND MASS DATA...:PRINTG6,...
  LOAD LAND MASS DATA...:PRINTG6,...
  FILL IN SEAS...
30 PRINTG6,...REMOVE SEAS...:PRINTG6
  ...SAVE DISPLAY...:PRINTG6,...V
  ERTICAL OFFSET...
370 ***** UP OR DOWN *****
380 C=RPD(2):IF C=2 THEN CONST=+3 E
  LSE CONST=-3
390 ** CALCULATE BATHYMETRY **
400 FOR N=1 TO SIDE-1
410 FOR I=1 TO SIDE-1
420 IF A#B:Z THEN Y(N,Z)=Y(N,Z)+C
  ORST ELSE Y(N,Z)=Y(N,Z)-CONST
430 NEXT I,N
440 ***** DRAW OCEAN LINE *****
450 PRODE4,0:PCLS
460 FOR Z=SIDE TO 1 STEP-1
470 FOR M=1 TO SIDE
480 LINE(X(M-1,Z),Y(M-1,Z)-1:X(M,Z)
  ,Y(M,Z)),PSET
490 LINE(X(M,Z),Y(M,Z)-1:X(M,Z)+1:Y(M,Z)),PSET
500 NEXT M,Z
510 LINE(X(0,SIDE),Y(0,SIDE)-1:X(1,0
  ),Y(0,0)),PSET
520 LINE(X(SIDE,0),Y(SIDE,0)+1:X(SIDE
  ,SIDE)),PSET
530 FOR A=1 TO 4:FORB=A+4 TO 4:NEXT
  A
540 PRODE4,1:SCREEN1,0
550 NEXT B,N,K

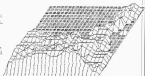
```



```

560 PROCEDURE,1:SCREEN1,1:GOTO40
580 'DRAW IN AS 3D-SOLID
590 FOR Z=SIZE TO 1 STEP -1
600 FOR W=1 TO SIZE
610 X1=X2W-1,Z;X2=X2W,Z;X3=X2W
,Z-1;X4=X2W-1,Z-1
620 Y1=Y2W-1,Z;Y2=Y2W,Z;Y3=Y2W
,Z-1;Y4=Y2W-1,Z-1
630 A1=(Y1-Y2)/(X3-X2);B1=Y1-A1*X1
IF
640 IF B1 THEN IF Y1=Y2 AND Y1=150
-2*Y THEN COLOR1,1 ELSE COLOR1,
0
650 FOR X=1 TO X2
660 Y=A1*X+B1
670 LINE(X,Y)=(X3,Y3),PSET
680 NEXT X
690 A1=(Y4-Y3)/(X4-X3);B1=Y4-(A1)*X4
700 FOR X=X4 TO X3
710 Y=A1*X+B1
720 LINE(X1,Y1)=(X,Y),PSET
730 NEXT X
740 LINE(X1,Y1)=(X2,Y2),PSET;LINE=(
X3,Y3),PSET;LINE=(X4,Y4),PSET;L
INE=(X1,Y1),PSET
750 NEXT W,Z
760 COLOR1,0
770 LINE(X1,0),Y1,0)=(X1SIZE,0),
Y1SIZE,0);PSET;LINE=(X1SIZE,0
20),Y1SIZE,SIZE);PSET
780 PEEK=&FF,0
790 SOUND(0,1
800 SCREEN1,1
810 GOTO40
820 'MOVE LANDSCAPE
830 PRINT:INPUT"ENTER LAND SHIFT OF
PSET":n
840 FOR W=1 TO SIZE-1:FOR Z=1 TO S1
Z=-1+Y1W,Z;Y2=Y1W,Z;A:REST 2,W;G
OTO20
850 'FILL IN THE SEA
860 SCREEN1,0:FOR W=0 TO SIZE
870 FOR Z=0 TO SIZE
880 IF Y1W,Z>150-2*Y THEN Y2W,Z=
150-2*Y ELSE Y2W,Z=Y1W,Z
890 X2W,Z=X1W,Z
900 NEXT Z,W
910 K=1
920 PROCEDURE,1:POL5:SCREEN1,0:GOTO590
C'DRAW LAND MASS
930 'REMOVE SEA
940 SCREEN1,0:FOR W=0 TO SIZE:FOR Z
=0 TO SIZE
950 Y2W,Z=Y1W,Z;Y3=Y2W,Z;X3=X1W,Z;X4
=
960 PROCEDURE,1:POL5:SCREEN1,0:GOTO590
970 CLS:PRINT:GOTO, "GIVE LANDSCAPE D
ATA":PRINT:PRINT
980 INPUT "FILE TITLE":FILE#
990 WRITE FILE#;SIZE
1000 FOR A=0 TO SIZE:FOR B=0 TO S1Z
E
1010 WRITE FILE#;A,B
1020 WRITE FILE#;Y1A,B
1030 NEXT B,A
1040 CLOSE
1050 GOTO20
1060 CLS:PRINT:GOTO, "LOAD LANDSCAPE
DATA":PRINT:PRINT
1070 INPUT"ENTER FILE TITLE":FILE#
1080 READ FILE#;SIZE
1090 FOR A=0 TO SIZE:FOR B=0 TO S1Z
E
1100 READ FILE#;X1A,B
1110 READ FILE#;Y1A,B
1120 NEXT B,A
1130 CLOSE
1140 W=120/SIZE
1150 GOTO20
1160 PRINT:INPUT"GIVE DISPLAY TITLE
":TAR
1170 SAVE AS,1075,9255,48194:GOTO50
1180 '©1984 BY PETER WHITTAKER,

```



Mission impossible

David Berry sets his sights on a high-flying foe.

THE FIRST thing is nothing more than a list of instructions; there's no reason on Earth for anyone to type it in; just read and digest. The second is the Basic part of the program which does all the slow speed settings/guardians on. Be careful to type the first two lines exactly as I have them or you'll get trouble saving high scores which are stored in the second line in place of all three scores. Each time you get a new high score restore the Basic part of the program. My highest was 2480. The final block is the machine code.

Rapier is a shooting gallery. You're sitting in the rear gun turret of some jetcraft and in front of you is a target which can be controlled from the keyboard or through the joystick. Across your field of view, just in range of your missiles, flies an endless stream of enemy aircraft. Presumably understood after a delay your missile is launched and starts heading towards the centre of your sight. Remember that the missile has no interest in the other than finding the centre of the sight. When it gets there it explodes whether or not the sight is fixed on an aircraft at the time. One tip I'll give you is that if you wait until you've held the sight on an aircraft before firing you'll almost always miss. You have to fire the

Listing 1 — Instructions

```
100 REM INSTRUCTIONS FOR RAPIER.
110 REM CLORD "RAPIER" WHEN RUN
120 REM The machine code will be
130 REM loaded by the programme.
140 REM Use a joystick in the BH
150 REM mode. The sight moves
160 REM the sight and the fire
170 REM button launches the miss
180 REM -ile. The missile always
190 REM moves towards the centre
200 REM of the sight. The score
210 REM at which the sight moves
220 REM is variable depending on
230 REM the position of the sit-
240 REM .
250 REM Alternatively the key-
260 REM board can be used with
270 REM the G P 2 and space keys
280 REM for left, up, right and
290 REM down the G and P keys
300 REM to set the speed and
310 REM ENTER to fire.
320 REM You will pause the game
330 REM and reload data at,
```

missile then fix the aircraft and follow it through until the missile arrives which requires a nice bit of co-ordination.

Now and again the enemy will launch a counter-attack and fire a missile at you. These start off as pretty dodgy, easy to hit objects, but speed up as your score improves until, frankly, you don't have a

chance of hitting them. Then they hit you and you lose a life.

At the start you have three lives and can add another four by knocking out everything in sight before your score reaches 100. After that you're on the downbeat path. High flying aircraft are easier to hit since you have more time to fix your sight and so they score less than low flying ones. If your speed starts dropping up the joystick held 'X' down to pause the game; if you get suicidal press 'H' to end it all.

The Basic routine gives you a nice analysis at the end so you can see how badly you've done, whether your hitmiss ratio is improving or not. To have another go hit ENTER. Stopping is by the RESET button, I'm afraid.

If you don't want to type it all in (who can blame you?) send me a tape, return postage and two quid (per tape) to bribe the wife with and you'll get a copy straight out of the computer. Please, please, have the tape positioned where you want Rapier put and allow plenty of room as well (no squashing for odd corners of space on your tapes). You also need to say which side of the tape to put it on and whether you want a duplicate on the same tape.

David Berry, 6 Mandrup Close, High Cross, Rye, BN26 6BN, Sussex. Tel 0323 804.

Listing 2 — Basic

```
10 DATA 32: (0) 0:DEFPY 1783
20 (0)PARA(1):000000:000000:000000
30 IF PEEK(147000)<0>GOTO THEN GOON 470
40 CLEAR 100:CHGEFF
50 GOON 0-0
60 PCLDR 0
70 PHGE 3
80
90 SCREEN 1:0
100 COLOR 0-3
110 POL 0
120 GOON 100
130 GOON 200
140 PCOPY 0 TO 0
150 PCOPY 0 TO 0
160 PCOPY 0 TO 0
170 PCOPY 0 TO 0

180 DATA 04000,04001,047001,0400,047000,0400,047000,00,047000,00,047001,00,04701
0,00,047010,00,047010,00,047010,03,047010,0,047010,0,047010,0,047010,0,047010,0,0
047010,0,047010,0,047010,0,047010,0,047010,0,047010,0,047010,0,047010,0,047010,0,0
047010,047010
270 DATA 047010,0400,047000,047010,047010,047010,047010,047010,047010,047010,047010
380 FOR R=1 TO 27
```



```

390 READ I,J:FOR I=1 TO 100
400 FOR J=1 TO 100:READ A(I,J):
410 NEXT J
420 GOTO 470:END
430 GOTO 470:END
440 FOR I=1 TO 100:
450 PRINT I:FOR J=1 TO 100:
460 GOTO 470:END
470 GOTO 470:END
480 GOTO 470:END
490 GOTO 470:END
500 GOTO 470:END
510 GOTO 470:END
520 GOTO 470:END
530 GOTO 470:END
540 GOTO 470:END
550 GOTO 470:END
560 GOTO 470:END
570 GOTO 470:END
580 GOTO 470:END
590 GOTO 470:END
600 GOTO 470:END
610 GOTO 470:END
620 GOTO 470:END
630 GOTO 470:END
640 GOTO 470:END
650 GOTO 470:END
660 GOTO 470:END
670 GOTO 470:END
680 GOTO 470:END
690 GOTO 470:END
700 GOTO 470:END
710 GOTO 470:END
720 GOTO 470:END
730 GOTO 470:END
740 GOTO 470:END
750 GOTO 470:END
760 GOTO 470:END
770 GOTO 470:END
780 GOTO 470:END
790 GOTO 470:END
800 GOTO 470:END
810 GOTO 470:END
820 GOTO 470:END
830 GOTO 470:END
840 GOTO 470:END
850 GOTO 470:END
860 GOTO 470:END
870 GOTO 470:END
880 GOTO 470:END
890 GOTO 470:END
900 GOTO 470:END
910 GOTO 470:END
920 GOTO 470:END
930 GOTO 470:END
940 GOTO 470:END
950 GOTO 470:END
960 GOTO 470:END
970 GOTO 470:END
980 GOTO 470:END
990 GOTO 470:END
1000 GOTO 470:END

```

7000	DATA	*****	+0F	71	24	24	03	8D	71	64	26	03	8D	73	84	8D	72	43	
7010	DATA	*****	+00	70	31	12	12	12	12	86	72	03	27	03	8D	73	8D	10	
7020	DATA	*****	+12	12	00	74	34	74	70	00	00	00	00	00	00	00	00	00	
7030	DATA	*****	+04	74	70	00	04	0F	84	04	07	70	30	8D	73	00	00	70	
7040	DATA	*****	+0F	6D	72	03	39	0E	00	40	30	1F	26	FC	3F	00	00	00	
7050	DATA	*****	+20	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	
7060	DATA	*****	+0E	1E	00	8E	4E	00	10	0E	00	00	01	00	01	31	3E		
7070	DATA	*****	+26	70	8D	70	04	0D	0F	44	38	00	00	00	00	00	00	00	
7080	DATA	*****	+15	80	02	50	44	70	64	43	04	0F	14	68	98	04	0F	0E	
7090	DATA	*****	+72	40	0F	70	00	04	70	12	07	70	02	74	00	00	74	70	
7100	DATA	*****	+00	F4	70	62	10	0E	70	10	46	40	06	00	00	70	00	A7	
7110	DATA	*****	+04	30	00	20	12	12	52	14	24	05	7C	70	00	7C	70	00	
7120	DATA	*****	+70	70	00	04	00	00	70	10	07	04	10	00	30	12	12	12	
7130	DATA	*****	+54	24	F0	74	70	00	10	0E	70	03	F4	70	02	30	04	00	
7140	DATA	*****	+00	70	00	00	10	A7	04	30	05	07	04	31	21	04	03	10	
7150	DATA	*****	+1C	47	04	30	00	07	04	3F	00	00	00	00	00	00	00	00	
7160	DATA	*****	+4F	3E	0E	71	00	A6	04	4F	00	00	04	46	02	01	00	20	
7170	DATA	*****	+0C	0C	01	07	04	3F	00	00	00	00	00	00	00	7F	00	20	00
7180	DATA	*****	+FF	07	10	FF	03	0F	00	71	02	06	71	00	44	00	20	00	
7190	DATA	*****	+0C	60	20	07	71	21	07	71	20	44	04	03	70	71	20	00	
7200	DATA	*****	+71	20	07	71	20	00	70	01	0C	71	20	FD	32	01	00	70	
7210	DATA	*****	+00	0F	72	01	0E	70	00	0F	71	20	04	72	02	07	71	24	
7220	DATA	*****	+3F	20	03	10	70	71	40	14	3F	04	05	07	71	40	00	71	
7230	DATA	*****	+02	33	0F	10	00	00	04	10	04	10	00	00	30	00	20	0C	
7240	DATA	*****	+04	00	04	70	71	20	07	11	00	71	45	10	00	70	00	F4	
7250	DATA	*****	+70	24	50	0C	A5	00	71	20	00	04	00	00	00	F4	71	24	
7260	DATA	*****	+10	0C	70	00	A6	03	07	04	10	70	71	10	12	00	00	00	
7270	DATA	*****	+00	74	71	00	0F	01	39	04	40	07	71	00	00	70	47	00	
7280	DATA	*****	+71	01	33	4C	10	01	70	03	26	F0	02	37	0F	00	71	01	
7290	DATA	*****	+3F	10	10	10	10	00	04	34	1C	FC	44	24	02	04	00	00	
7300	DATA	*****	+24	04	40	24	03	0C	00	02	00	04	0F	00	00	00	00	00	
7310	DATA	*****	+00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	
7320	DATA	*****	+12	05	70	00	10	70	70	10	00	10	00	72	02	00	00	30	1F
7330	DATA	*****	+01	3F	00	00	00	4F	40	20	44	34	36	00	0F	40	02	30	
7340	DATA	*****	+34	A4	04	04	04	01	3D	07	04	00	04	00	00	00	01	33	3F
7350	DATA	*****	+04	60	04	0C	10	20	24	03	2F	07	07	00	04	00	00	00	
7360	DATA	*****	+20	1F	01	15	2F	02	20	13	01	00	2F	07	10	3C	3C	44	
7370	DATA	*****	+04	20	00	01	01	2F	02	2C	12	04	04	07	70	37	37	12	
7380	DATA	*****	+12	12	12	04	72	01	01	34	26	00	70	72	01	01	05	24	
7390	DATA	*****	+03	70	72	01	04	72	02	01	10	26	03	70	72	00	01	03	
7400	DATA	*****	+26	03	74	72	03	3F	00	00	00	00	00	00	00	00	00	00	
7410	DATA	*****	+00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	
7420	DATA	*****	+10	00	00	00	00	00	00	70	02	00	03	04	00	00	70	00	04
7430	DATA	*****	+72	01	44	27	0E	00	04	70	72	41	24	03	70	72	00	01	
7440	DATA	*****	+04	1C	72	07	72	42	3F	00	00	00	00	00	00	00	00	00	
7450	DATA	*****	+7F	44	00	04	0F	24	A6	03	44	04	44	4F	12	12	12	12	
7460	DATA	*****	+00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	
7470	DATA	*****	+00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	
7480	DATA	*****	+00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	
7490	DATA	*****	+00	20	05	10	74	73	02	34	44	04	03	07	73	02	00	71	
7500	DATA	*****	+20	30	00	33	0F	10	00	0C	04	00	04	33	00	00	00	00	
7510	DATA	*****	+00	0C	04	0D	04	74	71	20	07	33	00	71	43	10	00	7C	
7520	DATA	*****	+00	F4	71	24	50	0C	05	00	71	20	10	04	30	00	01	F0	
7530	DATA	*****	+71	24	10	00	72	10	04	05	07	04	37	70	71	10	10	00	
7540	DATA	*****	+0E	70	00	04	00	30	0F	01	00	33	0F	10	00	00	04	07	
7550	DATA	*****	+04	00	00	00	00	24	F2	04	00	30	0F	FC	00	33	44	04	
7560	DATA	*****	+00	A0	04	04	07	04	30	00	00	34	F2	00	70	30	10	10	
7570	DATA	*****	+33	0F	10	00	0C	04	0D	04	30	00	00	10	0C	04	10	04	
7580	DATA	*****	+3F	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	
7590	DATA	*****	+70	70	70	04	0F	0F	44	44	0F	0F	0F	0F	0F	0F	0F	0F	
7600	DATA	*****	+0F	12	0F	00	00	00	00	00	00	00	00	00	00	00	00	00	
7610	DATA	*****	+00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	
7620	DATA	*****	+00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	
7630	DATA	*****	+03	04	01	12	04	70	00	27	07	73	02	74	73	10	10	30	
7640	DATA	*****	+06	73	01	01	72	02	00	00	70	72	01	00	72	02	7F	73	
7650	DATA	*****	+02	20	0F	07	0C	70	73	01	40	00	72	02	7F	73	02	20	
7660	DATA	*****	+01	47	40	00	0F	44	44	44	44	44	44	44	44	00	07	73	00
7670	DATA	*****	+3F	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
7680	DATA	*****	+01	00	01	10	04	74	30	27	07	07	74	02	74	74	00	0F	
7690	DATA	*****	+04	74	31	01	72	01	13	00	30	74	31	00	72	01	7F	74	
7700	DATA	*****	+12	20	0F	27	0C	7C	74	30	40	00	72	01	7F	74	02	20	

Concealing Data

Dene Bebbington shows you how to encode and decode text files

THERE ARE times in computing when it is necessary or desirable to hold or transmit data in an encoded form so that unauthorized users cannot examine sensitive or personal data. For example, on the UNIX operating system users' passwords are stored in an encoded form so that even if somebody does get into the password file he will not be able to see them unless he knows the encoding technique and the keyword used. Data encryption methods can to some extent prevent the abuse of computer systems.

There are two main methods of coding, these being substitution and transposition. The substitution methods work by substituting each character by some other (being determined by the technique and keyword being used). Transposition methods work by changing the order of the characters in the text, so that all the characters are the same but are jumbled up to conceal the original text. Obviously if a technique uses both substitution and transposition then the code will be very hard to break compared to if just one method was used.

Here I present a program which allows users to encode and decode text files (stored on cassette) using a substitution method.

The method presented here is a more advanced version of the PLAYFAIR code which was used in the first world war to encode secret messages. It is based upon a matrix which contains all the available characters, but where the order depends on a keyword entered by the user. Thus as the encoded text depends on the keyword, different text will be obtained from different keywords.

The program (see Listing 1) works by typing up a 7 row by 8 column matrix, thus allowing 42 different characters. The characters that are allowed are "ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789", "?" (where "?" is a space), A keyword entered and is stripped of illegal

and repeating characters. For example, the keyword "ONCE UPON A TIME" would finally be "ONCEUPAIME". Their then go into the matrix along with the unused characters. Here the matrix would be:

```
ONCE U
P A T I M E
B D F G H J
K L O R S V
W X Y Z 0 1
2 3 4 5 6 7
8 9 , . ?
```

Where again "" is a space.

Characters are encoded in pairs so that if a line has an odd number of characters a space is added at the end of the line, if the two characters being examined are in the same row then we add 1 to the columns, eg Pm would be encoded as Qn. If we go off the end then we "wrap around", eg Vj would be encoded as Gk. The same rule applies to characters in the same column except that we add 1 to the rows, so that AZ would be encoded as B3, if they are not in the same row or column then we take the characters at the opposite corners, so that BC would be encoded as HK.

Modular

We apply the same principles decoding except that instead of adding 1 to the row or column we take away 1 from it, remembering to wrap around if necessary. We apply the same rule for characters that are not in the same row or column.

The program works by reading in a text file from cassette to be encoded or decoded, after processing the file is saved back onto cassette in the encoded or decoded form. The user must enter the name of the file and is prompted to press the cassette recorder when the file is to be read in or saved.

The program has been written in a modular manner and consists of several subroutines which are called from within the main body of the program, that is lines 2480 to 2680. This makes it easy to modify

to make use of a disc drive or allow more characters etc.

The important subroutine is the one at lines 1680 to 2180 as this actually encodes or decodes a message depending on the value of the variable BC, it does this by setting AD to 1 if encoding or -1 if decoding, this is then used to calculate the row or column of pairs of letters.

The other two important subroutines are those to find the position of the two letters in the matrix (lines 1840 to 1960) and to strip illegal characters from a line of text (lines 1980 to 2080).

To set up a test file containing a message to be encoded use the program given in Listing 2. It allows up to 100 lines of text to be entered, and input is terminated when 100 lines have been input or when a full stop is entered on a new line.

As the program needs a keyword to encode and decode you may be wondering which is the best to use. Well, when a method such as this is being used which puts the keyword and remaining letters in a matrix the most effective way is to have a keyword which contains as few repeating characters as possible and contains at least as many characters as are allowed by the program. This makes it more difficult for the code to be broken. For example, the keyword "CONSTANTINOPLE 752094?" gives a better matrix than the keyword "ZORDEER".

It should be remembered that the same keyword must be used for both encoding and decoding otherwise all stage results will be obtained!

The ability to conceal data on a computer by encrypting techniques can be useful when the data being held is only to be seen by authorized users or when messages which are being transmitted are to be kept secret. This program could easily be modified to encode data stored in a database and on cassette or disk, or to decode messages sent from computer to computer over a network or telephone line.

Listing 1

```
1  " = data encoding program "
2  "
3  " = (see 1680) encoding "
4  " = (see 2180) decoding "
5  " = (see 1840) find row "
6  " = (see 1960) find column "
7  " = (see 1980) strip illegal "
8  " = (see 2080) strip illegal "
9  " = (see 2180) strip illegal "
10 " = (see 2180) strip illegal "
11 " = (see 2180) strip illegal "
12 " = (see 2180) strip illegal "
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98 " = (see 2180) strip illegal "
99 " = (see 2180) strip illegal "
100 " = (see 2180) strip illegal "
```

```
1180 PRINT "
1190 "
1200 " = (see 1680) encoding "
1210 " = (see 2180) decoding "
1220 " = (see 1840) find row "
1230 " = (see 1960) find column "
1240 " = (see 1980) strip illegal "
1250 " = (see 2080) strip illegal "
1260 " = (see 2180) strip illegal "
1270 " = (see 2180) strip illegal "
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1950 " = (see 2180) strip illegal "
1960 " = (see 2180) strip illegal "
1970 " = (see 2180) strip illegal "
1980 " = (see 2180) strip illegal "
1990 " = (see 2180) strip illegal "
2000 " = (see 2180) strip illegal "
```

[illegible]

Listing 2

[illegible]

News desk

If you have any new products for the Dragon — software or hardware — ring the News Desk on 01-437 4363



Current sponge

INTEGRITY Solutions have produced an anti-static kit for microcomputers. The kit, which comprises five leads with plastic heads running to a 'static sink' unit, which is in turn attached to an earth lead, costs £49.95 and seems to include an anti-static sponge and cleaning fluid. This might well be of interest to those using expensive computers in a high-static (dry-clean carpet, non-complimentary environment like an office. Otherwise, static protection can

be improvised more cheaply with fine insulated wire run from a VDU screen or microcassette to a reliable earth point like a metal radiator.

"Recent surveys indicate that some 70% of computer service calls are due to static electricity", state Integrity, and our own electronic consultants confirm that this could, indeed, be the case. Enquiries to Integrity Solutions, 504 Manchester Road, Suddon, Rochdale, Lancs OL16 2HE.

Extend the 64

HAPPIS Micro Software, previously known for disk-based applications programs for the Dragon 32 and 64, is offering BASIC 42, designed solely for the Dragon 64, which, the makers claim, greatly extends its capabilities.

The program comes on disk, for Dragonoids, though other formats may be available in due course, and makes use of the 64's ability to operate in "Map type 1" with 64K DRAM. The program boots into the cur-

riously named DOS, and then takes to memory from BASIC. The existing list of BASIC and RPL of DOS are retained, but modified.

BASIC 42 allows printing on the full screen with standard PRINT commands, using 24 lines of 40 characters per line, redefinable character sets, repeating key up to eight user-defined windows plus one full, full non-destructive window, inverted video, underlining, some extra print com-

mands and functions, commands at lower case, and automatic startup of a BASIC program.

The new program occupies some 4K of memory, and allows other utilities to be loaded in from disk as required. Three such utilities are already written: a program that "patches" the known bugs in Dragonoid 1.0, a print "spooler", which allows the computer to be used while the printer is operating, and a "help" utility which extends some of the features of BASIC 42, with BREAK, disable, scroll, disable, pause listing, improved TRON (including single-stepping, plus expanded help and error messages).

Harris Micro Software hope to extend this range of utilities to cover extra disk commands, graphics utilities such as icons and sprites, extra sound capabilities, "teleplay" program, communications software, and more. The "open-ended" nature of BASIC 42 means that it is possible to ex-

tend the Dragon's capabilities almost indefinitely.

The price for the core program BASIC 42, including alternative character sets, character drawing program, and Dragonoid patches, is £14.95. The HELP utility, and the SPOOL utility, will sell for £5 each. The programs will be available from October 1st.

Micro Show

THE East and West Computer Show is being held at the Park House, Cardiff on 15th November from 10 to 5.

We have no news as to whether any of the Dragon suppliers will be able to attend, but there should be something to interest multi-micro users.

For more information contact Preston Exhibitions, Kings Hall Court, St. Brides Major, telf Glamorgan CF32 0SE. Tel (0369) 66696.

Classified

MAXIMUS PRESENTS: UNDER THE DOME OF CROMH An original adventure set in an underground world of dragons, trolls, and wizards. £3.95

CRASHMANIA A 50 game computer for 10 players. Includes Break-out, Spider, Chess, Hangman, Anagrams etc. Excellent family entertainment. £19.95

MAXIMUS AND SPELLBOOK Two amazing spellbooks for mathematics and spelling for age 6-12. Approximately 1000 each of £3.95

DRAGON MUSIC Performance is a top performance. First price on tape. £10.95 (1st 1, 2nd 1, 3rd 1, 4th 1, 5th 1, 6th 1, 7th 1, 8th 1, 9th 1, 10th 1, 11th 1, 12th 1, 13th 1, 14th 1, 15th 1, 16th 1, 17th 1, 18th 1, 19th 1, 20th 1, 21st 1, 22nd 1, 23rd 1, 24th 1, 25th 1, 26th 1, 27th 1, 28th 1, 29th 1, 30th 1, 31st 1, 32nd 1, 33rd 1, 34th 1, 35th 1, 36th 1, 37th 1, 38th 1, 39th 1, 40th 1, 41st 1, 42nd 1, 43rd 1, 44th 1, 45th 1, 46th 1, 47th 1, 48th 1, 49th 1, 50th 1, 51st 1, 52nd 1, 53rd 1, 54th 1, 55th 1, 56th 1, 57th 1, 58th 1, 59th 1, 60th 1, 61st 1, 62nd 1, 63rd 1, 64th 1, 65th 1, 66th 1, 67th 1, 68th 1, 69th 1, 70th 1, 71st 1, 72nd 1, 73rd 1, 74th 1, 75th 1, 76th 1, 77th 1, 78th 1, 79th 1, 80th 1, 81st 1, 82nd 1, 83rd 1, 84th 1, 85th 1, 86th 1, 87th 1, 88th 1, 89th 1, 90th 1, 91st 1, 92nd 1, 93rd 1, 94th 1, 95th 1, 96th 1, 97th 1, 98th 1, 99th 1, 100th 1, 101st 1, 102nd 1, 103rd 1, 104th 1, 105th 1, 106th 1, 107th 1, 108th 1, 109th 1, 110th 1, 111th 1, 112th 1, 113th 1, 114th 1, 115th 1, 116th 1, 117th 1, 118th 1, 119th 1, 120th 1, 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Mode 24

Paul Wicks raises lower case characters and hi res graphics.

THIS PROGRAM gives the user true lower case characters on the screen, underlining, reverse text, limited user defined graphics capabilities, 64x160 pixel resolution and still allows at the Dragon's eight colours to be displayed on the screen simultaneously - all from Basic.

The program is written in relocatable machine code, and occupies less than 1k of memory (although it uses the default value of four graphics pages for display).

The hex loader in listing 1 can be used to enter the data in listing 2. The addresses shown in listing 2 place the program at the very end of available RAM although if you wish to leave this memory free of other machine code programs then a lower start address can be used.

To save the program once it is in memory type `CSWEM "filename", start address, start address+5000, start address (ENTER)` or for the addresses given: `CSWEM "MODE24" 50000&HFFFA HX000 (ENTER)`

To reload and run the program first type `CLGAR 300, start address-1 (ENTER)` then `CLGADR "filename" (ENTER)` then `EXEC (ENTER)` or with the given addresses: `CLGAR 300&HFFFA (ENTER)` `CLGADR "MODE24" (ENTER)` `EXEC (ENTER)`

On running the screen clears to amber text on a black background (reverse video, amber screen). BASIC commands including `PRINT` is and `CLS` in etc. all work as normal with the following additions:
`PRINT CHR$(37)` reverts to the normal text screen (not mode 24).
`PRINT CHR$(38)` causes the text to be inverted.
`PRINT CHR$(39)` switches the underlining on and off.
`PRINT CHR$(30)` switches between the amber and green screen display.

These control codes are given in table 2 and an example of how they work is given in listing 3.

`(CHR$(7) (X))` is used as normal to get lower case text except that lower case is now displayed as true lowercase and not as inverse text (to get inverse text use `PRINT CHR$(28) "text here"; CHR$(28) ;`). An example of the type of graphics which can be obtained and of how to set points and draw circles in any colour using BASIC is given in listing 5. To find which character is displayed at a particular point on the screen the functions in listing 4

`DEF FN(P)=PEEK&H800+(32*INT(P/32))+P` can be used which returns the PEEK/POKE value given in table 3 of the character at `PRINT` at position `H` on the screen.

Finally, an example of how to define your own characters for use with `MODE24` is given in listing 3 which when used in conjunction with table 1 allows you to redefine any of the lower case characters, `CH-PR` (38) and `ASCI` characters 123 to 127 in a 6x7 matrix.

Listing 1 — Hex Loader

```
10 'HELLOADER
20 CLS
30 C=0:CH=0
40 INPUT "START ADDRESS (HEX) ";A$
50 A=VAL("A"&H"&A$)
60 PRINT "ADDRESS ";HEX$(A)
70 INPUT "BYTE ";B$
80 IF B$="X" THEN END
90 P=VAL("A"&H"&B$)
100 POKE A,P
110 CH=CH+P
120 C=C+1:IF C=8 GOSUB 140
130 A=A+1:GOTO 50
140 PRINT "CHECKSUM OF LAST 8 BYTES ";HEX$(CH)
150 C=C+1:CH=0:RETURN
```

Listing 2 — Mode 24 Hex Dump

ADDR	HEX	POKE	CHARACTER	ADDR	HEX	POKE	CHARACTER
0000	20	8C	50	87	41	10	10
0008	35	87	87	91	41	10	10
000E	74	87	81	9A	87	70	87
0014	71	87	8A	87	55	88	55
001A	71	87	8A	87	55	88	55
0020	84	87	81	8C	89	40	87
0028	84	87	81	8C	89	40	87
0030	84	87	81	8C	89	40	87
0038	84	87	81	8C	89	40	87
0040	84	87	81	8C	89	40	87
0048	84	87	81	8C	89	40	87
0050	84	87	81	8C	89	40	87
0058	84	87	81	8C	89	40	87
0060	84	87	81	8C	89	40	87
0068	84	87	81	8C	89	40	87
0070	79	57	48	50	30	37	48
0078	79	57	48	50	30	37	48
0080	88	71	60	50	50	50	50
0088	88	71	60	50	50	50	50
0090	88	71	60	50	50	50	50
0098	88	71	60	50	50	50	50
00A0	88	71	60	50	50	50	50
00A8	88	71	60	50	50	50	50
00B0	88	71	60	50	50	50	50
00B8	88	71	60	50	50	50	50
00C0	88	71	60	50	50	50	50
00C8	88	71	60	50	50	50	50
00D0	88	71	60	50	50	50	50
00D8	88	71	60	50	50	50	50
00E0	88	71	60	50	50	50	50
00E8	88	71	60	50	50	50	50
00F0	88	71	60	50	50	50	50
00F8	88	71	60	50	50	50	50
0100	88	71	60	50	50	50	50
0108	88	71	60	50	50	50	50
0110	88	71	60	50	50	50	50
0118	88	71	60	50	50	50	50
0120	88	71	60	50	50	50	50
0128	88	71	60	50	50	50	50
0130	88	71	60	50	50	50	50
0138	88	71	60	50	50	50	50
0140	88	71	60	50	50	50	50
0148	88	71	60	50	50	50	50
0150	88	71	60	50	50	50	50
0158	88	71	60	50	50	50	50
0160	88	71	60	50	50	50	50
0168	88	71	60	50	50	50	50
0170	88	71	60	50	50	50	50
0178	88	71	60	50	50	50	50
0180	88	71	60	50	50	50	50
0188	88	71	60	50	50	50	50
0190	88	71	60	50	50	50	50
0198	88	71	60	50	50	50	50
01A0	88	71	60	50	50	50	50
01A8	88	71	60	50	50	50	50
01B0	88	71	60	50	50	50	50
01B8	88	71	60	50	50	50	50
01C0	88	71	60	50	50	50	50
01C8	88	71	60	50	50	50	50
01D0	88	71	60	50	50	50	50
01D8	88	71	60	50	50	50	50
01E0	88	71	60	50	50	50	50
01E8	88	71	60	50	50	50	50
01F0	88	71	60	50	50	50	50
01F8	88	71	60	50	50	50	50
0200	88	71	60	50	50	50	50
0208	88	71	60	50	50	50	50
0210	88	71	60	50	50	50	50
0218	88	71	60	50	50	50	50
0220	88	71	60	50	50	50	50
0228	88	71	60	50	50	50	50
0230	88	71	60	50	50	50	50
0238	88	71	60	50	50	50	50
0240	88	71	60	50	50	50	50
0248	88	71	60	50	50	50	50
0250	88	71	60	50	50	50	50
0258	88	71	60	50	50	50	50
0260	88	71	60	50	50	50	50
0268	88	71	60	50	50	50	50
0270	88	71	60	50	50	50	50
0278	88	71	60	50	50	50	50
0280	88	71	60	50	50	50	50
0288	88	71	60	50	50	50	50
0290	88	71	60	50	50	50	50
0298	88	71	60	50	50	50	50
02A0	88	71	60	50	50	50	50
02A8	88	71	60	50	50	50	50
02B0	88	71	60	50	50	50	50
02B8	88	71	60	50	50	50	50
02C0	88	71	60	50	50	50	50
02C8	88	71	60	50	50	50	50
02D0	88	71	60	50	50	50	50
02D8	88	71	60	50	50	50	50
02E0	88	71	60	50	50	50	50
02E8	88	71	60	50	50	50	50
02F0	88	71	60	50	50	50	50
02F8	88	71	60	50	50	50	50
0300	88	71	60	50	50	50	50
0308	88	71	60	50	50	50	50
0310	88	71	60	50	50	50	50
0318	88	71	60	50	50	50	50
0320	88	71	60	50	50	50	50
0328	88	71	60	50	50	50	50
0330	88	71	60	50	50	50	50
0338	88	71	60	50	50	50	50
0340	88	71	60	50	50	50	50
0348	88	71	60	50	50	50	50
0350	88	71	60	50	50	50	50
0358	88	71	60	50	50	50	50
0360	88	71	60	50	50	50	50
0368	88	71	60	50	50	50	50
0370	88	71	60	50	50	50	50
0378	88	71	60	50	50	50	50
0380	88	71	60	50	50	50	50
0388	88	71	60	50	50	50	50
0390	88	71	60	50	50	50	50
0398	88	71	60	50	50	50	50
03A0	88	71	60	50	50	50	50
03A8	88	71	60	50	50	50	50
03B0	88	71	60	50	50	50	50
03B8	88	71	60	50	50	50	50
03C0	88	71	60	50	50	50	50
03C8	88	71	60	50	50	50	50
03D0	88	71	60	50	50	50	50
03D8	88	71	60	50	50	50	50
03E0	88	71	60	50	50	50	50
03E8	88	71	60	50	50	50	50
03F0	88	71	60	50	50	50	50
03F8	88	71	60	50	50	50	50
0400	88	71	60	50	50	50	50
0408	88	71	60	50	50	50	50
0410	88	71	60	50	50	50	50
0418	88	71	60	50	50	50	50
0420	88	71	60	50	50	50	50
0428	88	71	60	50	50	50	50
0430	88	71	60	50	50	50	50
0438	88	71	60	50	50	50	50
0440	88	71	60	50	50	50	50
0448	88	71	60	50	50	50	50
0450	88	71	60	50	50	50	50
0458	88	71	60	50	50	50	50
0460	88	71	60	50	50	50	50
0468	88	71	60	50	50	50	50
0470	88	71	60	50	50	50	50
0478	88	71	60	50	50	50	50
0480	88	71	60	50	50	50	50
0488	88	71	60	50	50	50	50
0490	88	71	60	50	50	50	50
0498	88	71	60	50	50	50	50
04A0	88	71	60	50	50	50	50
04A8	88	71	60	50	50	50	50
04B0	88	71	60	50	50	50	50
04B8	88	71	60	50	50	50	50
04C0	88	71	60	50	50	50	50
04C8	88	71	60	50	50	50	50
04D0	88	71	60	50	50	50	50
04D8	88	71	60	50	50	50	50
04E0	88	71	60	50	50	50	50
04E8	88	71	60	50	50	50	50
04F0	88	71	60	50	50	50	50
04F8	88	71	60	50	50	50	50
0500	88	71	60	50	50	50	50
0508	88	71	60	50	50	50	50
0510	88	71	60	50	50	50	50
0518	88	71	60	50	50	50	50
0520	88	71	60	50	50	50	50
0528	88	71	60	50	50	50	50
0530	88	71	60	50	50	50	50
0538	88	71	60	50	50	50	50
0540	88	71	60	50	50	50	50
0548	88	71	60	50	50	50	50
0							

Listing 3 — User defined graphics

```
10 CLS
20 LET A=96 'ASCII code of character to define.
30 DATA 76,112,77,88,112,84,93
40 ' data to define character (see table 1).
50 GOSUB 100 ' call user define routine.
60 PRINT"This is the character":PRINT"you defined: ";CHR$(A)
70 END
90 '
100 'define character
110 IF A<96 OR A>127 THEN PRINT"CHR$(":A:") OUT OF RANGE":STOP
115 A=INT(A)
120 AD=PEEK(160)*256+PEEK(161)+496+7*(A-96)
130 FOR N=AD TO AD+6
140 READ D
150 POKE N,D
160 NEXT
170 RETURN
```

Listing 4

```
10 DEF FNP(P)=PEEK(48600+352*INT(P/32)+P)
20 'replace PEEK(48400+P)
30 'lower case characters return code of upper case equivalents'
40 '
50 CLS
55 FOR I=0 TO 1
60 FOR N=12 TO 255
70 PRINTN+1*224,CHR$(N);
80 PRINT0,USING"###";FNP(N+1*224);
90 FOR E=1 TO 56:NEXT
100 NEXT
110 PRINTCHR$(28);
120 NEXT
```

Listing 5 — Demonstration of plotting coloured circles in MODE 24

```
10 'circle routine
20 'MODE MODE 24
30 '
40 CLS
50 R0=8:YC=0 'centre of circle
60 FOR C=1 TO 8 'colours
70 R=R0-R*C 'radius
100 '
110 'circle routine
120 FOR TH=0 TO 2 *PI
130 X=X0+R*COS(TH)
140 IF ABS(X-X0) > 0 THEN GOSUB 100
150 Y=Y0+R*SIN(4.7*YC-TH)GOSUB 100
160 X=X0+R*SIN(4.7*YC-TH)GOSUB 100
170 Y=Y0+R*SIN(4.7*YC-TH)GOSUB 100
180 NEXT
190 NEXT
200 END
210 '
220 FOR N=81 TO 80 STEP -1:FOR I=0 TO 10
230 X=X0+R0*I:Y=Y0+R0*I:GOSUB 100
240 X=X0+R0*I:Y=Y0+R0*I:GOSUB 100
250 NEXT
260 RETURN
270 '
280 'Max R0=63, Y0=191, C10=0
290 IF X0 OR Y0 OR C10 OR C11 OR C12 OR C13 OR C14 THEN GOTO 110
300 AD=48600+INT(I/31)*256+I*32
310 B=PEEK(AD)
320 IF B/27 THEN B=128
330 IF C0 THEN B=B AND (4870-14*C1-10 AND 111)GOTO 110
340 B=B AND 128
350 B=B OR (B/27-1)*16
360 B=B OR (C11-12 AND 111)
370 POKE AD,B
380 RETURN
```

Listing 8 — Demonstration

```
10 CLS
20 US=CHR$(39)
30 IS=CHR$(28)
40 PRINT" Upper and lower case test."
50 PRINT
60 PRINT" ";US;"Underlining";US
70 PRINT
80 PRINT" ";IS;"Inverse video";IS
90 PRINT
100 PRINT" Special characters: ";CHR$(96);
110 FOR N=123 TO 127:PRINTCHR$(N);:NEXT
120 PRINT:PRINT
130 PRINT" And all 8 colours ";
140 FOR N=0 TO 7:PRINTCHR$(114+16*N);:NEXT
150 PRINTCHR$(128)
160 PRINT
```

Table 1 — Poke Numbers for user-defined graphics

00000	96	96	96	96	96	96	96
00001	74	74	74	74	93	92	92
00010	124	105	126	0	126	105	124
00011	0	0	0	0	0	0	0
00100	65	84	84	84	84	84	84
00101	0	0	0	0	0	0	0
00110	0	0	0	115	0	0	0
00111	93	0	0	0	0	0	93
01000	126	104	124	0	124	104	126
01001	0	68	68	68	68	68	0
01010	99	99	116	86	86	99	99
01011	0	0	0	0	0	0	0
01100	112	122	122	123	122	122	112
01101	0	0	0	84	0	0	0
01110	120	94	106	120	106	0	120
01111	0	100	0	131	0	0	0
10000	76	76	76	76	76	76	76
10001	85	85	85	85	85	85	87
10010	0	112	112	112	112	112	0
10011	0	0	0	71	0	101	101
10100	0	102	75	0	75	0	0
10101	0	0	77	77	64	64	0
10110	0	0	0	0	0	0	0
10111	0	0	0	0	0	0	0
11000	0	0	0	108	108	0	0
11001	101	101	0	0	0	0	0
11010	0	0	0	0	0	0	0
11011	0	77	99	0	99	87	0
11100	91	0	0	0	0	0	91
11101	0	0	0	0	0	0	0
11110	66	0	117	69	0	106	66
11111	69	0	123	107	125	0	69

Table 2 — control codes

```
CHR$( 27 ) -
Return to normal
(mode24) test
screen
CHR$( 28 ) -
Inverse / true video
toggle
CHR$( 29 ) -
Underline on/off
toggle
CHR$( 30 ) -
Green / amber screen
toggle
```

Table 3 — code for Fh(F)			
CHR\$	CHR	normal	inverse
32		96	32
33	!	97	33
34	"	98	34
35	#	99	35
36	\$	100	36
37	%	101	37
38	&	102	38
39	'	103	39
40	(	104	40
41	)	105	41
42	*	106	42
43	+	107	43
44	,	108	44
45	-	109	45
46	.	110	46
47	/	111	47
48	0	112	48
49	1	113	49

continued				74	J	34	10	101	a	69	5
				75	K	35	11	102	f	70	6
CHR# CHR normal inverse				76	L	36	12	103	g	71	7
50	2	114	50	77	M	37	13	104	h	72	8
51	3	115	51	78	N	38	14	105	i	73	9
52	4	116	52	79	O	39	15	106	j	74	10
53	5	117	53	80	P	40	16	107	k	75	11
54	6	118	54	81	Q	41	17	108	l	76	12
55	7	119	55	82	R	42	18	109	m	77	13
56	8	120	56	83	S	43	19	110	n	78	14
57	9	121	57	84	T	44	20	111	o	79	15
58	:	122	58	85	U	45	21	112	p	80	16
59	;	123	59	86	V	46	22	113	q	81	17
60	<	124	60	87	W	47	23	114	r	82	18
61	=	125	61	88	X	48	24	115	s	83	19
62	>	126	62	89	Y	49	25	116	t	84	20
63	?	127	63	90	Z	50	26	117	u	85	21
64	@	84	0	91	[	51	27	118	v	86	22
65	A	85	1	92	\	52	28	119	w	87	23
66	B	86	2	93	]	53	29	120	x	88	24
67	C	87	3	94	^	54	30	121	y	89	25
68	D	88	4	95	_	55	31	122	z	90	26
69	E	89	5	96	`	56	0	123	+	91	27
70	F	90	6	97	a	57	1	124	-	92	28
71	G	91	7	98	b	58	2	125	=	93	29
72	H	92	8	99	c	59	3	126	>	94	30
73	I	93	9	100	d	60	4	127	?	95	31

0000	0001	0002	0003	0004	0005	0006	0007	0008	0009	0010	0011	0012	0013	0014	0015	0016	0017	0018	0019	0020	0021	0022	0023	0024	0025	0026	0027	0028	0029	0030	0031	0032	0033	0034	0035	0036	0037	0038	0039	0040	0041	0042	0043	0044	0045	0046	0047	0048	0049	0050	0051	0052	0053	0054	0055	0056	0057	0058	0059	0060	0061	0062	0063	0064	0065	0066	0067	0068	0069	0070	0071	0072	0073	0074	0075	0076	0077	0078	0079	0080	0081	0082	0083	0084	0085	0086	0087	0088	0089	0090	0091	0092	0093	0094	0095	0096	0097	0098	0099	0100	0101	0102	0103	0104	0105	0106	0107	0108	0109	0110	0111	0112	0113	0114	0115	0116	0117	0118	0119	0120	0121	0122	0123	0124	0125	0126	0127	0128	0129	0130	0131	0132	0133	0134	0135	0136	0137	0138	0139	0140	0141	0142	0143	0144	0145	0146	0147	0148	0149	0150	0151	0152	0153	0154	0155	0156	0157	0158	0159	0160	0161	0162	0163	0164	0165	0166	0167	0168	0169	0170	0171	0172	0173	0174	0175	0176	0177	0178	0179	0180	0181	0182	0183	0184	0185	0186	0187	0188	0189	0190	0191	0192	0193	0194	0195	0196	0197	0198	0199	0200	0201	0202	0203	0204	0205	0206	0207	0208	0209	0210	0211	0212	0213	0214	0215	0216	0217	0218	0219	0220	0221	0222	0223	0224	0225	0226	0227	0228	0229	0230	0231	0232	0233	0234	0235	0236	0237	0238	0239	0240	0241	0242	0243	0244	0245	0246	0247	0248	0249	0250	0251	0252	0253	0254	0255	0256	0257	0258	0259	0260	0261	0262	0263	0264	0265	0266	0267	0268	0269	0270	0271	0272	0273	0274	0275	0276	0277	0278	0279	0280	0281	0282	0283	0284	0285	0286	0287	0288	0289	0290	0291	0292	0293	0294	0295	0296	0297	0298	0299	0300	0301	0302	0303	0304	0305	0306	0307	0308	0309	0310	0311	0312	0313	0314	0315	0316	0317	0318	0319	0320	0321	0322	0323	0324	0325	0326	0327	0328	0329	0330	0331	0332	0333	0334	0335	0336	0337	0338	0339	0340	0341	0342	0343	0344	0345	0346	0347	0348	0349	0350	0351	0352	0353	0354	0355	0356	0357	0358	0359	0360	0361	0362	0363	0364	0365	0366	0367	0368	0369	0370	0371	0372	0373	0374	0375	0376	0377	0378	0379	0380	0381	0382	0383	0384	0385	0386	0387	0388	0389	0390	0391	0392	0393	0394	0395	0396	0397	0398	0399	0400	0401	0402	0403	0404	0405	0406	0407	0408	0409	0410	0411	0412	0413	0414	0415	0416	0417	0418	0419	0420	0421	0422	0423	0424	0425	0426	0427	0428	0429	0430	0431	0432	0433	0434	0435	0436	0437	0438	0439	0440	0441	0442	0443	0444	0445	0446	0447	0448	0449	0450	0451	0452	0453	0454	0455	0456	0457	0458	0459	0460	0461	0462	0463	0464	0465	0466	0467	0468	0469	0470	0471	0472	0473	0474	0475	0476	0477	0478	0479	0480	0481	0482	0483	0484	0485	0486	0487	0488	0489	0490	0491	0492	0493	0494	0495	0496	0497	0498	0499	0500	0501	0502	0503	0504	0505	0506	0507	0508	0509	0510	0511	0512	0513	0514	0515	0516	0517	0518	0519	0520	0521	0522	0523	0524	0525	0526	0527	0528	0529	0530	0531	0532	0533	0534	0535	0536	0537	0538	0539	0540	0541	0542	0543	0544	0545	0546	0547	0548	0549	0550	0551	0552	0553	0554	0555	0556	0557	0558	0559	0560	0561	0562	0563	0564	0565	0566	0567	0568	0569	0570	0571	0572	0573	0574	0575	0576	0577	0578	0579	0580	0581	0582	0583	0584	0585	0586	0587	0588	0589	0590	0591	0592	0593	0594	0595	0596	0597	0598	0599	0600	0601	0602	0603	0604	0605	0606	0607	0608	0609	0610	0611	0612	0613	0614	0615	0616	0617	0618	0619	0620	0621	0622	0623	0624	0625	0626	0627	0628	0629	0630	0631	0632	0633	0634	0635	0636	0637	0638	0639	0640	0641	0642	0643	0644	0645	0646	0647	0648	0649	0650	0651	0652	0653	0654	0655	0656	0657	0658	0659	0660	0661	0662	0663	0664	0665	0666	0667	0668	0669	0670	0671	0672	0673	0674	0675	0676	0677	0678	0679	0680	0681	0682	0683	0684	0685	0686	0687	0688	0689	0690	0691	0692	0693	0694	0695	0696	0697	0698	0699	0700	0701	0702	0703	0704	0705	0706	0707	0708	0709	0710	0711	0712	0713	0714	0715	0716	0717	0718	0719	0720	0721	0722	0723	0724	0725	0726	0727	0728	0729	0730	0731	0732	0733	0734	0735	0736	0737	0738	0739	0740	0741	0742	0743	0744	0745	0746	0747	0748	0749	0750	0751	0752	0753	0754	0755	0756	0757	0758	0759	0760	0761	0762	0763	0764	0765	0766	0767	0768	0769	0770	0771	0772	0773	0774	0775	0776	0777	0778	0779	0780	0781	0782	0783	0784	0785	0786	0787	0788	0789	0790	0791	0792	0793	0794	0795	0796	0797	0798	0799	0800	0801	0802	0803	0804	0805	0806	0807	0808	0809	0810	0811	0812	0813	0814	0815	0816	0817	0818	0819	0820	0821	0822	0823	0824	0825	0826	0827	0828	0829	0830	0831	0832	0833	0834	0835	0836	0837	0838	0839	0840	0841	0842	0843	0844	0845	0846	0847	0848	0849	0850	0851	0852	0853	0854	0855	0856	0857	0858	0859	0860	0861	0862	0863	0864	0865	0866	0867	0868	0869	0870	0871	0872	0873	0874	0875	0876	0877	0878	0879	0880	0881	0882	0883	0884	0885	0886	0887	0888	0889	0890	0891	0892	0893	0894	0895	0896	0897	0898	0899	0900	0901	0902	0903	0904	0905	0906	0907	0908	0909	0910	0911	0912	0913	0914	0915	0916	0917	0918	0919	0920	0921	0922	0923	0924	0925	0926	0927	0928	0929	0930	0931	0932	0933	0934	0935	0936	0937	0938	0939	0940	0941	0942	0943	0944	0945	0946	0947	0948	0949	0950	0951	0952	0953	0954	0955	0956	0957	0958	0959	0960	0961	0962	0963	0964	0965	0966	0967	0968	0969	0970	0971	0972	0973	0974	0975	0976	0977	0978	0979	0980	0981	0982	0983	0984	0985	0986	0987	0988	0989	0990	0991	0992	0993	0994	0995	0996	0997	0998	0999	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1999

* If you are not a U.S. citizen, you must be a permanent resident of the United States for at least 10 years before you can apply for citizenship.

[illegible]

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Quick CLS

A Daniel clears semigraphics the fast way with machine code.

THIS LITTLE programme is a simple machine code routine that can quickly clear any part of the low or high resolution screens or even the semigraphics screen which can only be cleared very slowly in Basic.

It is really a "must" for all basic users and no knowledge of machine code is required except, as with all machine code programmes you must save it before you try it as a typing mistake may cause an irretrievable crash.

You do, however, need to know the memory addresses of the screen locations. To remind you, the low resolution screen starts at 1024 and continues through 5414 to 6553. The High Res. screen starts at 16384 and uses a variable address number of pages according to the mode (see Manual), each page containing 1638 locations. The semigraphics 24 screen starts at 1024 and ends at 7679.

The listing below gives a free running

demonstration of blocks of colour being placed on areas of high res. and low res. screens on which a much slower basic pattern has been drawn. The semigraphics 24 screen is then cleared completely and a blue squiggle added to prove that it really is semigraphics! However I hope you will have realized by now that the potential of this routine is enormous.

To incorporate the first half of the listing in your own programme you must give values to 3 variables — S1, S2 and S3 as in the PBASIC line 50. S1 is the start address of the area to be cleared and must not be less than 1024. S2 is the end address of the area and S3 is the clearing colour. Of course you must also set up the mode and screen for high res. graphics or poke the appropriate numbers (as in line 346) for semigraphics.

To produce a uniform colour in lines, or semigraphics you can just enter the normal number (0-6) of the colour you require as the variable S3 in line 55. In highres, any number bet-

ween 0 and 255 will produce screen patterns but only 8 numbers will give uniform shades. These are 0 which produces the normal background colour, 255 - the normal foreground, and 85 and 193 which give the two remaining colours. The other two numbers 167 and 238 produce a composite colour which on my television set will give as a useful 50% shade! When using high res. (or if you wish to make patterns on low res.) you must delete lines 80 and 180 as otherwise the value of S3 will be corrupted.

The machine code pokes are contained in a subroutine so the programme proper ends at line 55. You can go from here to whenever you want and to operate the clearing just write EXOC56000.

If your programme needs a lot of string space increase the 200 in line 10. If you are using other machine code routines you may wish to lower the 20000 figure in line 10 or alter the start address in line 50.

```
30 REM INPUT ENTER START POINT, END P
G=INT, COLOUR (S1,S2,S3
40 GOSUB888
50 GOTO330
60 A=38888
70 IF S=1 THEN 110
80 IF S=2 THEN S3=1 ELSE S3=52810
90 IF S3<128 THEN S3=128: REM THIS L1
NE AND LINE 188 NOT REQUIRED IN HIGH RES
. MODES. VALUES FOR S3 CAN BE FOUND IN L
INE 230
100 S3=S3+127
110 POKEA,S3:END
120 IF S1<S2 AND S1>1823 AND S2>1823 A
ND S1<7681 AND S2<7681 THEN GOSUB188 CLS
E POKEA+1,888:POKEA+2,888: POKEA+3,888
5: POKEA+5,888
130 POKEA+3,888
140 POKEA+4,53
150 POKEA+5,888:POKEA+6,888:POKEA+
7,888
160 POKEA+8,888:POKEA+11,888:POKE
A+12,888
170 RETURN
180 S2=INT(S1+255): S8=S1-S2+255
190 S7=INT(S2+255): S8=S2-S7+255
200 POKEA+1,S2:POKEA+2,S8:POKEA+3,S7
POKEA+5,S8
210 RETURN
220 REM THIS IS A DEMONSTRATION ONLY:
TO CONSTRUCT YOUR OWN PROGRAMME YOU CAN
```

```
QUIT ALL THE FOLLOWING LINES
230 S4(S1-S1/54(1+85/54(2))-128: S4(3)-
187: S4(4)+238: S4(5)+235
240 D=0: ON D GOSUB348,318,358
250 GOSUB68
260 EXOC56000
270 IF S=3 THEN FOR J=1 TO 1823: NEXT J
FOR J=3888 TO 6888 STEP 33: POKEJ,125:
NEXT
280 FOR J=1 TO 1800: NEXT
290 IF S=3 THEN D=8:PRINT8180,"THAT WA
S SEMIGRAPHICS 24": FOR J=1 TO 1800: NE
XT
300 GOTO348
310 CLS:FOR B=288 TO 325: PRINT88,CHR#
CHR(223+5*B): NEXT B
320 S1=1184: S3=1536: S3=RD(13)-1
330 RETURN
340 PROC3,1= SCREEN1,8: PCLS
350 FOR B=1 TO 15: CIRCLECHR(158)+158,
RD(128)+581,RD(481),R=5(4): NEXT
360 S1=1536: S3=5888
370 S3=S4(S3): S3=S3+1: IF S3>5 THEN S
3=0
380 RETURN
390 POKE56472,8: POKE55475,1: POKE5347
7,1
400 FOR J=1 TO 1800: NEXT
410 S1=1824: S2=7679: S3=RD(13)-1
420 RETURN
```

Expert's Arcade Arena

Write to 'The Expert' at Dragon User
12-13 Little Newport St, London WC2H 7PP,
with all your arcade tips and hints.

JUST a shortish column this month because of its accompaniment, yes, for those of you newly acquainted with the term, masterpiece, here's a map of the opening section of *Coptic Smash*, together with some VERY helpful advice. Trust and enhance chances of getting past that line that goes up and down ONLY THREE GUINIS need be taken out. They are marked on the Map as 1, 2, and 3 for pretty obvious reasons. Can one must be taken out to enable a 100% success rate on take off if one should be while trying to take-out pairs two and three. These are the pairs that hinder you while trying to get past the up and down things! Right, that's the diagram explained, now then, who'd care to send me a map of the second stage. Plus a few tips on how to get there!

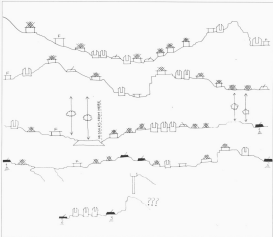
The winner of the "Who is The Expert?" Competition this month is a certain Andrew McLaughlin from Woking in Surrey, who suggests that I am in fact Brian of Nazareth. Nice try Andy, wrong, but a nice try, and your prize number three, two abstract and one material. Firstly, two pieces of totally

worthless but sensible pieces of advice... 1) Keep away from girls with spiky hair! and 2) Stop watching so much Monty-Python. And your material Prize, which you should have received about a month ago, is a Photograph, taken by my own fair hand, of a clump of grass from my back garden. I know, words tell you, you've been wondering who sent you that Photo for about a month haven't you?

Now then, some games news... Smithsonian are producing a game called *Frankie* about which I shall reveal no more but looks like being very good indeed. Keep reading this column for more news. New release from Microdeal soon looks like being a version of *BoulderDash*, with 28 screens (I think), a random choice (a-la *Screening Adoles*), and some wicked screens involving slime; this one looks like a masterpiece!

Your letters are still arriving, by the crate load, oh yes, and by the way, the Luminous pen crane is getting beyond a joke! This month I have received two letters in Luminous Pen from a Helen Marsdon in

Canterbury, and an Andrew Ridgely in Wales (surely not the Andrew Ridgely I saw at Andrew Wise Guy Yellow Pen Ridgely and Helen Hymphreusiac (you should read her letter — I'll send a copy to the first person who... no, what am I thinking about!) Pink Pen Marsdon, I've informed Norman Bates of your addresses and he'll be round for your conservative party membership fees very soon... Hah Hah Hah. Anyway, your letters, a cry from one Peter Martin from Llanvachin, "Dear Expert, please provide a map for at least the start of *Coptic Smash* as I think this would be a great help to many people" — Another say I never answer requests! — and also have you got around to maps for *Fantasy Rider* and *Brick's Kingdom* yet? — These I leave to you dear reader(s)! — "Please, some help with *GoAuto*" — "In working and!" — "Finally, to explain how you convinced that this is the part of the magazine I am to read... You should be allocated a lot more space! Do you write for any other magazines?" — No! — "Please, keep up the great work!" Thank you and good night!



If you've got a technical question write to Brian Gedge. Please do not send a SAE as Brian cannot guarantee to answer individual inquiries.

Dragon Answers

Baud rate

I AM thinking of buying a Modem, but want to know if I would need a Dragon 64 as I only have a 32 at the moment. Could you explain baud rate and Modem bits when used with modems?

S.J. Scofield
17 Oakdale Rd
Downend
Bristol

MOST modems talk to the computer via an RS232C serial interface which is built in on the 64 but not on the 32. Therefore, you either need to buy a new Dragon 64 or get one of the many RS232C cartridges available for your 32. Some company's such as Commodore and Petabyte will sell you an all in one package consisting of modem, RS232C cartridge and software ready to run.

The 'baud rate' is the speed at which data is sent down the serial interface. It's actually the number of times the signal line changes state in a second, but is often simply referred to as the number of bits sent per second.

Start bits are special bits sent before a byte of data to 'wake up' the computer at the other end and allow it to synchronise to the incoming data. stopbits simply inserts a gap between bytes of data and are sent after a byte of data.

Keyboard

I HAVE a Dragon 32 and my problem is that I don't have any keyboards. They say the CLEAR, ENTER and SHIFT keys. Can you tell me what's wrong and how to mend it?

R. Hardy
16 Grosvenor
Museum
Glasgow
Glasgow W10 5JN

YOUR problem is almost certainly caused by a failing keyboard unit, controlled by the CPU or other components. The keys you mention (plus the BREAK key which you'll probably find doesn't work either) are all on the same input line from the keyboard



matrix and so are likely to fail together. This means that the keyboard 'keys' are probably fine and there is simply a loose connection between keyboard and ribbon cable or ribbon cable and CPU board.

Alternatively, try contacting one of the repair services found on the pages of Dragon User for a quote on a new keyboard — you should be able to fit this yourself.

Music

I AM in the process of writing a game on my Dragon 64 and would like to know if it is possible to produce 'Interrupt Driven Music'. I know this is possible on the Commodore, Amstrad etc., but they have a different hardware.

Paul Nicholson
Stokeley
Ponsonby

THE DRAGON is certainly not famous for its tremendous sound capabilities, this is due to the fact that unlike almost every other decent home computer it does not contain a dedicated sound chip. Hence, when the Dragon wants to make a noise the 6809 must do all the work and cannot do anything else.

Therefore, it is not possible to produce true 'interrupt' sound. However, one huge used in some games (the Microsoft's 'Crazy Painter') is to have a routine which produces very short 'beeps' and call this routine from within the main game loop. You're limited to up tempo music but the results can be quite effective.

Sequel

THE OTHER day I was playing a game called 'The Ring of Darkness' on a friend's machine. He said he had had the game for a couple of years, now I am interested in buying the game but I can't find where to buy it. Could you tell me who produces the game and where I can get it from?

Ryan Allison
27 St. Marys Park
Crowth
Lincs LN11 3GF

THE RING of Darkness was produced by Winterson who have since released the sequel called 'Return of the Ring'. Both can still be obtained direct from Winterson at 38 Uplands Park Road, Enfield, Middlesex, priced at £8.99 each.

Stacked

I AM in the process of writing an assembler for Basic for my Dragon 32. The program is menu driven and I want a 'status' mode available, where the status of the flags register is shown.

The problem is where is the 'CC' stored? My reference manual says it is stored on the stack, but any attempt to push the CC will result in a different address.

Martin Owen
43 Church Road
Crowth
Crowth

IGATHER from your problems regarding the 'CC' (condition codes) register that you are actually writing a dis-

assembler rather than an assembler. The CC register is internal to the 6809 and is not 'stored' in memory at any physical address. You can access it in machine code by pushing it onto the stack with a PUSH CC command and getting it back into the accumulator with a PULS A command, followed by STA to store it in memory.

Of course, the CC is not relevant to a disassembler anyway and would only be referred to by a 6809 simulator which would be rather difficult to run in BASIC.

Sorting

I HAVE written a Mailing Address program for my Dragon with disc drive. It has many functions such as word search and list all addresses of same type etc. The problem I have is with sorting. The only way I know of sorting a file is to load it all into memory, sort it and rewrite it disc. This limits the number of records to around 200 (there's a way of being able to sort the file without having this limitation).

Robin Smart
40 Chaucer House
Chaucer Gardens
Barton
Surrey

THE solution to your problem seems to be to use random access files rather than load all the data into memory at once. You'll need to use the FREAD and FWRITE commands and decide on a fixed record length (108 characters should cover the longest name and address). There is a particular record 'N' in the file can be retrieved into A0 using:

```
FREAD "FILENAME",A0  
N-1/108,  
FOR 128,65
```

Most sort routines include lines to compare two strings and, if necessary, swap the two strings. All you need to do is read in the current records from disc before the comparison is made and write them back out if they are swapped over (you could use the SWAP command for this).



ROLL UP roll up, roll up, get your free-solution here tips, guaranteed, non-faltering and with no harmful additives. As there's no adventure which causes more questions in my mailing than *Winterspell's* *Juxtaposition*, I've decided it's about time to give a solution to the game, as it's been out long enough now for this not to spoil the adventure so much—being a solution, I have to print everything forwards rather than backwards, so I suggest you read only as far as the point you've reached in the adventure and see how to get past the problem there that's stumping you. If you read further and see something you didn't ought to, then you're only got yourself to blame.

Several readers have sent in solutions and part-solutions to this game, and thanks in particular to Richard Head of Manchester for his notes, but the one that was most detailed, being a step-by-step guide, came from adventure coordinator, Simon Hargrave of Gloucestershire. Thanks to Simon then for the following, though note that you'll still need to map out the various areas.

In Baron White's City

Look at the bed and get everything, then left-to-blue and tie sheets together to make a rope, press button on telephone to unlock door, wait till the droid is going away then open the door and get in via the red exit. Tie the rope to the bed and go down. Get the sleeping pits from the table and go to the shower rooms. **LOOK TAP** and **TURN TAP** then wait for the droid to arrive and short-circuit it. Get the blue keycard out. Leave via the door, go to the stairs, unlock the door and go down to ground level. Go to the elevator platform (don't go into the endless red zone!), wait for the car and board it when the doors open. Get the camera from the photo gallery. Only take the food from the droider droid when you need to eat. Go to the ante-room and put the sleeping pits in the caretaker's coffee. Get the white key card and the cup from the caretaker and unlock the door. Get the beeper mask, sticky tape and soldering iron. Go back to the silver area and wear the mask to enter the antechamber. When outside drop all but the mask, overalls, white ID tag and white key card. Though you'll need to return for some items later. Go to Baron White's fort.

To Enter a Building

To do this you need to be exactly at the building, i.e. standing so that you cannot

see it no matter which way you look, and then type **ENTER**.

Eating

At any time when you need to eat, enter a city and get the food from the food droid simply by asking it.

Nightfall

When night falls enter the reprint building and consume strength this way. Night falls every twenty pages.

In Baron White's Fort

Give the white key card to Baron, take the red ID tag and go to Baron Red's fort.

In Baron Red's Lands

Get the brown ID tag from Baron Red's fort, then go to the shaft which contains the mine. Mine the eight-eye droid by using the camera, take his space and go through the door. Dig for the red catfish. Take the one to Baron Red and he will give you the green ID tag. Go to Baroness Green's fort.

In Baroness Green's Lands

Go to the fort and get the inner tube from the shelf. Repair it with the sticky tape. Go to a power pyramidal and open the valve, then inflate the inner tube. Go to Baroness Green's fort.

In Baroness Brown's Lands

Go to the fort, then go north-east to a shaft by the mountains. Wear the inner tube and swim the river. Get the deads at the river from the skeleton and use the sander to go to Baroness Brown's fort.

In Baroness Green's Lands

Go to the tower, get the chemicals and use the sander unit to escape. Give the chemicals to Baroness Green in exchange for the blue ID tag. Go back to the river in Baroness Brown's lands and cross the river to Baron Blue's lands.

In Baron Blue's Lands

Go to the fort and get the thief. Go to the green river in Blue's lands and repair the panel with the soldering iron and the flux. Load the camera with the film and photograph the VDU message. Take this to Baron Blue for the yellow ID tag.

In Baron Yellow's Lands

Go to the fort and get the vacuum box. Go to the power pyramidal, which has a shut-off dial. Wear the overalls, mask and cyborgnet. Carry the vacuum box and descend the shaft. Get the phoenix egg from beside the lava stream and put it in the vacuum box. Go back to Baron Yellow and give him the egg in exchange for the pink ID tag.

In Baroness Pink's Lands

Go to the Hydroponics Dome, wear the magnetic boots and go up the ventilator shaft and get the olive key card. Get the seed from behind the panel. Oil the rusty droid and ask him to go west then unlock the door. Go to Baroness Pink's fort and get the seedkiller then go through the door which the droid unlocked. When you are entered by the weeds then spray them with the weedkiller. Plant the seed in the ground. Take the orchid to Baroness Pink in exchange for the black ID tag.

In Baroness Black's Lands

Go to the fort, open the door and diffuse the bomb by pressing the buttons in order: blue-red-green-red-blue. Take the sheet of music and give it to the music droid, whereupon he will play the musical notes which unlock the door. Enter the room containing the Juxtaposition! Do what the sign on the wall says and type **SPELL**.

Congratulations!

At least this is what you should now be told, along with the information that the adventure will be continued in Part II, *The Usurper of Dune*. You remember Part Two, it was the one that was going to be released by Easter. Easter 1990, that is, Maeln's mind, I'm sure it will be with us eventually, and very welcome to, judging by the numbers of people who want to have bought *Juxtaposition*.

The above solution, incidentally, isn't the only way of solving the game, as obviously there are a few things that can be done in different orders, so don't write in and say that your solution is better! On the other hand, if you can explain where the bonus log is, which a member asked about in the April issue of *Dragon User*, but which Simon 'The Solver' Hargrave couldn't find anywhere, then by all means write in and tell us.

Simon is contactable at Chawley Hill Farm, Iley, Dudley, Glos. GL11 5BN, and he also has lots of information to add to last month's details about *Maeln* and the *Maeln* area, where he's trying to get his score up from 210 to the maximum 240. He advises against using the save routine as this only saves your current location and not your character status, as well as apparently rendering the 'alchemy' ineffective against the hydra.

And that's pretty much all I have!

Adventure Contact

Adventure: Return of The Ring.

Problem: How to bind the six units for the time ring? How to use the copper ring, stolen, money sack and white pass? **Name:** Philip Callaghan, Address: 16 Penrhyn Road, Moss Pt, Staines, Staffs ST7 9EY.

Adventure: Williamsburg 3. **Problem:** Has anyone got a map? I need one. **Name:** Colin Mills, Address: 34 Leabank Drive, Northwick, Worcester WR9 7TA. **Adventure: Honor Faction.** **Problem:** I need help. **Name:** Stuart Scott, Address: 65 Ventnor Crescent, Melton Mowbray Leics LE13 3LN.

Adventure: 3/5/8/10/11/12/13/14/15/16/17/18/19/20/21/22/23/24/25/26/27/28/29/30/31/32/33/34/35/36/37/38/39/40/41/42/43/44/45/46/47/48/49/50/51/52/53/54/55/56/57/58/59/60/61/62/63/64/65/66/67/68/69/70/71/72/73/74/75/76/77/78/79/80/81/82/83/84/85/86/87/88/89/90/91/92/93/94/95/96/97/98/99/100/101/102/103/104/105/106/107/108/109/110/111/112/113/114/115/116/117/118/119/120/121/122/123/124/125/126/127/128/129/130/131/132/133/134/135/136/137/138/139/140/141/142/143/144/145/146/147/148/149/150/151/152/153/154/155/156/157/158/159/160/161/162/163/164/165/166/167/168/169/170/171/172/173/174/175/176/177/178/179/180/181/182/183/184/185/186/187/188/189/190/191/192/193/194/195/196/197/198/199/200/201/202/203/204/205/206/207/208/209/210/211/212/213/214/215/216/217/218/219/220/221/222/223/224/225/226/227/228/229/230/231/232/233/234/235/236/237/238/239/240/241/242/243/244/245/246/247/248/249/250/251/252/253/254/255/256/257/258/259/260/261/262/263/264/265/266/267/268/269/270/271/272/273/274/275/276/277/278/279/280/281/282/283/284/285/286/287/288/289/290/291/292/293/294/295/296/297/298/299/300/301/302/303/304/305/306/307/308/309/310/311/312/313/314/315/316/317/318/319/320/321/322/323/324/325/326/327/328/329/330/331/332/333/334/335/336/337/338/339/340/341/342/343/344/345/346/347/348/349/350/351/352/353/354/355/356/357/358/359/360/361/362/363/364/365/366/367/368/369/370/371/372/373/374/375/376/377/378/379/380/381/382/383/384/385/386/387/388/389/390/391/392/393/394/395/396/397/398/399/400/401/402/403/404/405/406/407/408/409/410/411/412/413/414/415/416/417/418/419/420/421/422/423/424/425/426/427/428/429/430/431/432/433/434/435/436/437/438/439/440/441/442/443/444/445/446/447/448/449/450/451/452/453/454/455/456/457/458/459/460/461/462/463/464/465/466/467/468/469/470/471/472/473/474/475/476/477/478/479/480/481/482/483/484/485/486/487/488/489/490/491/492/493/494/495/496/497/498/499/500/501/502/503/504/505/506/507/508/509/510/511/512/513/514/515/516/517/518/519/520/521/522/523/524/525/526/527/528/529/530/531/532/533/534/535/536/537/538/539/540/541/542/543/544/545/546/547/548/549/550/551/552/553/554/555/556/557/558/559/560/561/562/563/564/565/566/567/568/569/570/571/572/573/574/575/576/577/578/579/580/581/582/583/584/585/586/587/588/589/590/591/592/593/594/595/596/597/598/599/600/601/602/603/604/605/606/607/608/609/610/611/612/613/614/615/616/617/618/619/620/621/622/623/624/625/626/627/628/629/630/631/632/633/634/635/636/637/638/639/640/641/642/643/644/645/646/647/648/649/650/651/652/653/654/655/656/657/658/659/660/661/662/663/664/665/666/667/668/669/670/671/672/673/674/675/676/677/678/679/680/681/682/683/684/685/686/687/688/689/690/691/692/693/694/695/696/697/698/699/700/701/702/703/704/705/706/707/708/709/710/711/712/713/714/715/716/717/718/719/720/721/722/723/724/725/726/727/728/729/730/731/732/733/734/735/736/737/738/739/740/741/742/743/744/745/746/747/748/749/750/751/752/753/754/755/756/757/758/759/760/761/762/763/764/765/766/767/768/769/770/771/772/773/774/775/776/777/778/779/780/781/782/783/784/785/786/787/788/789/790/791/792/793/794/795/796/797/798/799/800/801/802/803/804/805/806/807/808/809/810/811/812/813/814/815/816/817/818/819/820/821/822/823/824/825/826/827/828/829/830/831/832/833/834/835/836/837/838/839/840/841/842/843/844/845/846/847/848/849/850/851/852/853/854/855/856/857/858/859/860/861/862/863/864/865/866/867/868/869/870/871/872/873/874/875/876/877/878/879/880/881/882/883/884/885/886/887/888/889/890/891/892/893/894/895/896/897/898/899/900/901/902/903/904/905/906/907/908/909/910/911/912/913/914/915/916/917/918/919/920/921/922/923/924/925/926/927/928/929/930/931/932/933/934/935/936/937/938/939/940/941/942/943/944/945/946/947/948/949/950/951/952/953/954/955/956/957/958/959/960/961/962/963/964/965/966/967/968/969/970/971/972/973/974/975/976/977/978/979/980/981/982/983/984/985/986/987/988/989/990/991/992/993/994/995/996/997/998/999/1000/1001/1002/1003/1004/1005/1006/1007/1008/1009/1010/1011/1012/1013/1014/1015/1016/1017/1018/1019/1020/1021/1022/1023/1024/1025/1026/1027/1028/1029/1030/1031/1032/1033/1034/1035/1036/1037/1038/1039/1040/1041/1042/1043/1044/1045/1046/1047/1048/1049/1050/1051/1052/1053/1054/1055/1056/1057/1058/1059/1060/1061/1062/1063/1064/1065/1066/1067/1068/1069/1070/1071/1072/1073/1074/1075/1076/1077/1078/1079/1080/1081/1082/1083/1084/1085/1086/1087/1088/1089/1090/1091/1092/1093/1094/1095/1096/1097/1098/1099/1100/1101/1102/1103/1104/1105/1106/1107/1108/1109/1110/1111/1112/1113/1114/1115/1116/1117/1118/1119/1120/1121/1122/1123/1124/1125/1126/1127/1128/1129/1130/1131/1132/1133/1134/1135/1136/1137/1138/1139/1140/1141/1142/1143/1144/1145/1146/1147/1148/1149/1150/1151/1152/1153/1154/1155/1156/1157/1158/1159/1160/1161/1162/1163/1164/1165/1166/1167/1168/1169/1170/1171/1172/1173/1174/1175/1176/1177/1178/1179/1180/1181/1182/1183/1184/1185/1186/1187/1188/1189/1190/1191/1192/1193/1194/1195/1196/1197/1198/1199/1200/1201/1202/1203/1204/1205/1206/1207/1208/1209/1210/1211/1212/1213/1214/1215/1216/1217/1218/1219/1220/1221/1222/1223/1224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An extended BASIC for the Dragon 64

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- Full upper/lower case/glyphics character set
- REDEFINABLE characters
- Alternative character sets.
- Control key for special characters
- REPEATING keys
- Commands in LOWER CASE (even filenames)
- 8 user-defined, independent WINDOWS
- 1 fixed, non-destructive window
- CATCH command for automatic return to window
- INVERTED VIDEO (green on black/black on green)
- True UNDERLINING
- Extra PRINT commands and functions
- ROW and COLUMN commands for easier printing
- LIBRARY lists commands and functions
- Automatic startup of BASIC program
- TEXT command for software compatibility
- Takes NO memory from BASIC
- Patches for Dragonos 1.0
- Can load in extra UTILITIES from disk

HELP UTILITY

Extensions to BASIC 42 includes:

- Change CURSOR character
- SCROLL disable
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